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Studies in the Prevention of Milk Fever.*

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INTRODUCTORY.

A.—Analyses of the blood of 82 consecutive cases of milk fever have invariably revealed a markedly low calcium content. These results were controlled by analyses of 34 blood samples from normal cattle, including 18 parturient cows, and of 81 blood samples from cases of bovine disease other than milk fever.

TABLE I.

	Milk Fever. (82 Cases.)	Normal Cattle. (34 Determinations).	Bovine Diseases other than Milk Fever. (81 Cases.)
	Mgms. Ca %.	Mgms. Ca %.	Mgms. Ca. %.
Maximal figure ...	7·76	11·11	11·71
Minimal figure ...	3·00	8·64	7·81
Average figure ...	5·13	10·02	9·44

FIG. 1.

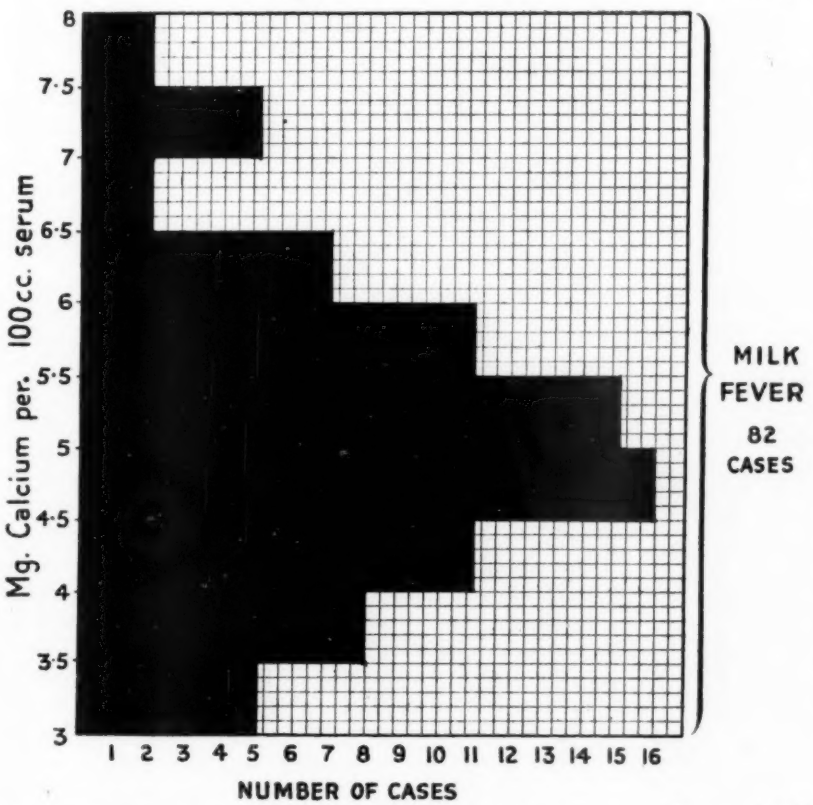

FIG. 1.—The cases have been arranged in groups having a range of 0·5 mgs. calcium. The number of cases in each group is represented by the horizontal length.

B.—As is well known, distension of the mammary gland, produced either by gaseous inflation or by the injection of fluid, is a specific treatment for the disease.

In a study of 15 cases of milk fever treated by mammary inflation it was found that this procedure caused a regular rise in the blood calcium values and that this rise was concurrent with, and bore direct relation to, the disappearance of the symptoms.

C.—In a recent paper (1) it was reported that a medicinal treatment of apparently specific value has been discovered in the intravenous and subcutaneous injection of calcium gluconate (Sandoz).

In a series of 53 cases of milk fever the great majority have been rapidly and completely cured with a *single* injection of calcium gluconate. In only three cases the injection of calcium failed to produce a markedly beneficial response. In each of these cases there is reason to believe that either an inadequate dose was injected or that the time allowed before mammary inflation was subsequently practised was insufficient.

D.—The fall in calcium is so acute and pronounced that it is probable that the concentration of other blood constituents, such as the phosphates, may also be affected in consequence, but, from the evidence obtained, the writer believes that acute calcium deficiency may now be fairly regarded as the essential cause of milk fever.

The pathogenesis of the disease, in the concept of the writer and his collaborators, is briefly as follows:—

At the onset of free lactation calcium is rapidly withdrawn from the blood and transferred to the milk, in which it occurs in high concentration. Normally, the parathyroid regulating mechanism is able to effect this transference with safety, by rapidly mobilising calcium from the skeletal reserves; but in the event of the regulating mechanism failing to replace the calcium in the blood, the calcium content of the blood falls to a level lower than that requisite for the maintenance of health, and the disease we call milk fever results.

Assuming this concept to be essentially true, it follows that prevention of the disease should be achieved by ensuring a relatively high concentration of calcium in the blood during the period of greatest susceptibility to attack, *i.e.*, the first 48 hours succeeding calving.

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E.—Before proceeding to discuss the means by which this may be effected, the more salient features of calcium metabolism will be briefly indicated:—

1. *Assimilation.*—While the assimilation of calcium from the gut is affected by many dietary factors, it would appear that it is mainly controlled by the degree of the intestinal cH. Shortly, it can be said that the more acid in reaction the intestinal contents, the greater will be the absorption of calcium. It has been shown that the inclusion of certain fats in the diet increases the assimilation of calcium, but this is probably due to these fats containing vitamin D which is known to effect a swing in the intestinal cH towards acidity.

2. *Mobilisation.*—The bones contain enormous deposits of calcium. Ninety-nine per cent. of the whole calcium content of the body is present in the skeleton, and, although this deposit is not immediately available for the needs of the soft tissues, it can be rapidly mobilised for this purpose and we now know that this is accomplished by the parathyroid secretion. Thus, the parathyroid secretion possesses the remarkable power of rapidly converting the deposited calcium in bone into an ionised and readily assimilable form.

3. *Fixation.*—The significance of calcium as an element of vital necessity to the tissues may be seen in the singular constancy of the degree of its concentration in the blood in any given individual. In cattle the normal range is between 9 mgms. and 11 mgms. per cent.; the figure usually is found between 9·5 mgms. and 10·5 mgms.; the mean average figure may be taken as 10 mgms. The control of blood calcium concentration must be effected by a mechanism of exquisite delicacy. It is now known that vitamin D has the power not only of aiding the assimilation of calcium from the gut, but of fixing it in the tissues.

Vitamin D, as is well known, is a derivative of ergosterol or some closely related sterol, and can be produced in many otherwise inactive fats and in the body tissues themselves by exposure to ultra-violet light.

4. *Excretion and Secretion.*—Calcium is excreted almost wholly by the large intestine and by the kidney and any excess in the tissues under normal conditions is rapidly removed. Thus, the intravenous injection of large doses of calcium is quickly followed by a markedly increased excretion.

In milch cows calcium is heavily secreted in the milk in which it occurs in high concentration. Half a gallon of colostrum contains as much calcium as exists in the blood at any one time. This means that in, say, a two-gallon lactation the blood calcium has to be replenished four times.

Table II.—Case No. 13, "Maisie."

1st sample	1½ hours before calving	9·52 mgrms. calcium
	Calved.	
2nd sample	7½ hours after calving	8·79 mgrms. calcium
3rd ,,	15½ ,, ,,	8·84 ,, ,,
4th ,,	66 ,, ,,	9·69 ,, ,,

In order to determine the effect of the initial secretion of colostrum upon the blood calcium concentration, the following observations on two cows were made:—

Lactation commenced just after calving, and was active when the second sample was taken.

Table III.—Case No. 15, "Hazel."

1st sample	21 hours before calving	10·97 mgrms. calcium
2nd ,,	13½ ,, ,,	9·77 ,, ,,
3rd ,,	4½ ,, ,,	10·09 ,, ,,
	Calved.	
4th sample	10½ hours after calving	10·45 mgrms. calcium
5th ,,	21 ,, ,,	9·41 ,, ,,

In this case a moderate lactation commenced before calving, between the collection of the first and second samples, when the calcium fell approximately by 10 per cent. It gradually returned to normal, but fell again when a profuse lactation set in between the collection of the fourth and fifth samples (Fig. 2).

Fig. 2.

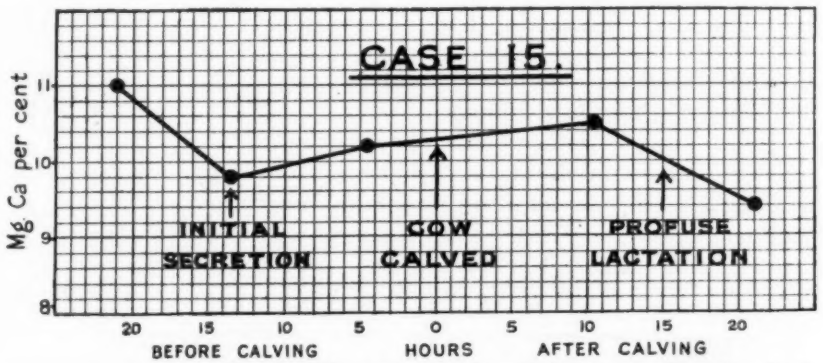


Fig. 2.—This curve shows in graphic form the data given in the preceding table.

These results suggest that the onset of milk secretion is accompanied by a transient but appreciable fall in the blood calcium which returns to normal after the crisis of initiation of lactation is passed.

Methods of Prevention.

1. *Inclusion of Calcium in the Food.*—Cases have been reported to the writer in which it was shown that certain herds grazed on lime-deficient pastures were highly susceptible to milk fever. In other herds, grazed on pastures rich in lime, the disease seldom made its appearance. But many cows which fall victims to milk fever receive an abundance of calcium in their food, and, while it is probable that the disease may be partially controlled by ensuring the inclusion of an adequate quantity of calcium in the diet, in all probability this plentiful supply of calcium is lost to the animal because of a highly alkaline condition of the intestinal contents.

The data so far obtained are too meagre to permit of any definite conclusion being drawn.

2. *Mobilisation from Calcium Reserves.*—The injection of an extract of the parathyroid glands rapidly produces a markedly increased concentration of blood calcium, but this increase is transient and may be followed by a phase of hypocalcæmia. In one case of milk fever, Sjollema (2) injected a parathyroid preparation (Collip). The case made a very rapid recovery, but this was followed by a definite

relapse. The procedure would not appear to be one of practical value; but it is possible that the simultaneous injection of a readily assimilable salt of calcium, such as the gluconate, with parathyroid extract may prove a practicable measure. Experiments on these lines are proceeding.

3. *Prevention of Excretion of Calcium in the Milk.*—Since, as has been indicated, the onset of free lactation rapidly deprives the blood of its calcium and this in turn produces a clamant need for the rapid replacement of calcium from the skeletal reserves, it follows that the retardation of milk secretion would tend to prevent the disease.

An empirical method of prevention, consisting in the repeated withdrawal of only small quantities of milk during the first 72 hours succeeding calving, has long been practised by dairymen. The undoubted preventive value of this procedure is probably due to the depressant action of increased intramammary pressure upon lactation.

The chief disadvantage of this method of prevention is seen in the decreased milk yield which not uncommonly follows.

4. *Stabilisation of Calcium in the Tissues.*—Although it is true that many cows which fall victims to milk fever receive an apparently adequate supply of vitamin D in their food, it appeared to the writer that the concentration of blood calcium might be influenced by the administration of *massive* doses of vitamin D by the mouth.

As is well known, the disease, after the first attack, is likely to recur with each succeeding parturition, and an aged Lincoln-Aberdeen Angus cow which had been attacked upon each of her last seven successive parturitions was selected for observation.

Eight samples of blood were drawn during a period of 69 days. Just after the collection of the eighth sample, a massive dose of vitamin D (expressed as 50,000 Ostelin units) was given by mouth, and this dose was repeated daily for 20 days. During this period six samples were drawn at intervals of seven, two, four, three and four days.

As will be seen from Table IV and the accompanying chart (Fig. 3), the administration of vitamin D was followed by a sharp rise in the blood calcium which persisted until at least the ninth day of treatment, after which it fell within the normal range wherein it appeared again to become stabilised.

On the 89th day the vitamin D administration was suddenly stopped and two days later a marked fall occurred, the abnormally low figure of 8·45 mgms. being registered.

Four days later the figure was again within the normal range and in this it continued until the 124th day, on which day the cow calved at 8 a.m. After calving she appeared to be perfectly well until 7.30 a.m. next morning when the onset of milk fever was observed. There was slight but distinct tetany of the hind limbs and difficulty in maintaining stance. Decubitus accompanied by the typical somnolence developed and, when the case was in this condition, a sample was taken at 10.30 a.m. Convulsions were absent and sensibility was not markedly interfered with. The case was to be regarded as mild in type.

The case continued in this condition throughout the evening and night, but by 6.30 a.m. next morning the cow had made a spontaneous recovery without any treatment having been applied.

It will be observed that the calcium figures were low

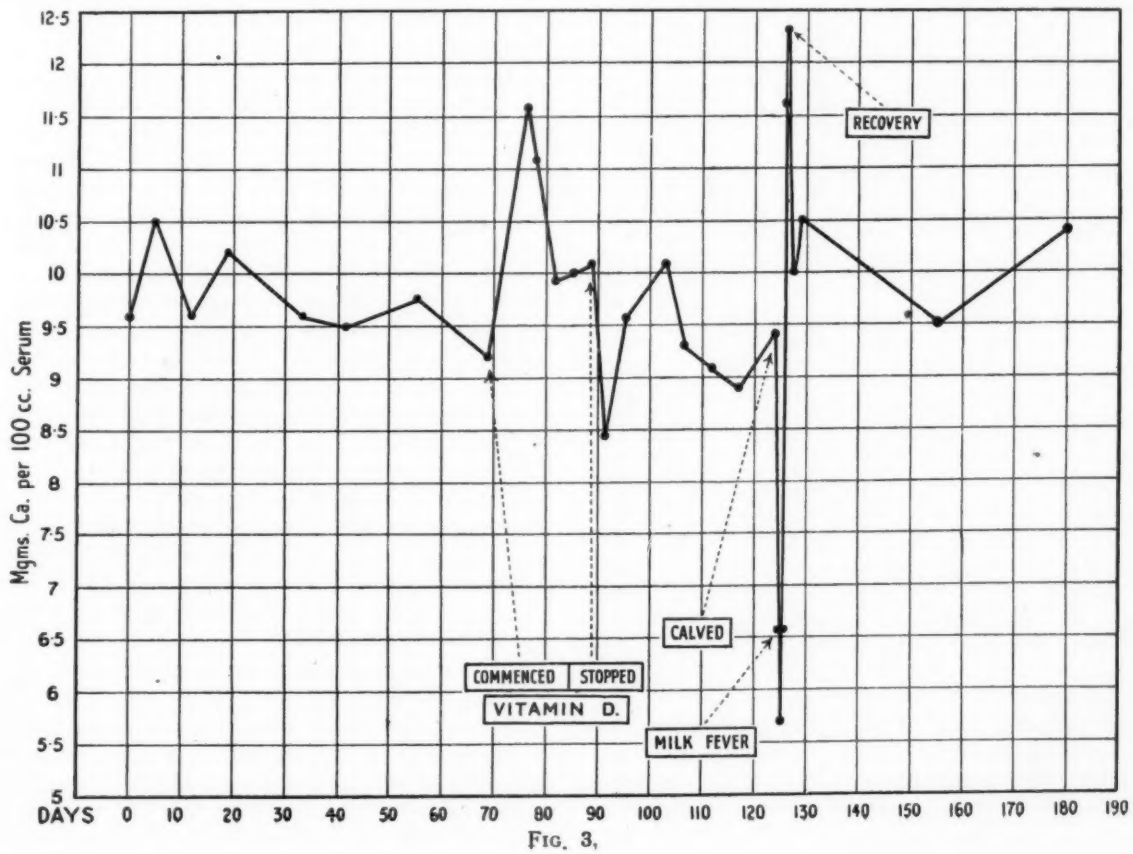


Fig. 3.

during the attack, but upon recovery setting in they rose to a point (12·35 mgms.) much above normal; thereafter there was another steep decline to within the normal limits.

This case shows very clearly that when any sudden change in the concentration of blood calcium is induced there is a tendency for an over-shooting effect to occur.

For example, the administration of vitamin D in massive doses first produced a marked hypercalcæmia, but later equilibrium was established. Stoppage of the vitamin resulted, however, in a well-marked temporary hypocalcæmia.

Similarly, the onset of milk fever was accompanied by an intense hypocalcæmia and the spontaneous recovery processes not merely restored the blood calcium to normal but actually produced a temporary hypercalcæmia. Immediately thereafter there was a sudden drop until a point within the normal range was again reached.

An examination of the chart (fig 3) suggests that there are powerful reflex mechanisms regulating the concentration of blood calcium; that these are called into play by any deviation from the normal of the blood calcium; and the compensatory mechanisms evoked are so powerful that they usually produce considerable over-action.

The chart also indicates that as a general principle it may be stated that the effect of any factors which deflect the level of the calcium figures above or below a mean average of 10 mgms. per cent. is countered by the controlling mechanism, and that the sharper the deflection from the normal the more acute is this counteraction.

This case also suggests that it is difficult to produce a sustained hypercalcæmia by administration of excess of vitamin D; therefore, while it would appear that this agent could be effectively used as a preventive measure against milk fever, it should be administered only a few days before calving. By this means the period in which the cow is most susceptible to attack would be passed on the " up stroke " of the calcium rise.

Table IV.

Aged Cross-Bred Lincoln-Aberdeen Angus Cow.

Remarks.	Mgms. Ca%	Days.
	9·59	0
	10·50	5
	9·59	12
	10·20	19
	9·60	33
	9·49	41
	9·74	55
Vitamin D administration commenced immediately after taking this sample.	9·19	69
	11·51	76
	11·10	78
	9·94	82
	10·02	85
Vitamin D administration ceased immediately after taking this sample.	10·05	89
	8·45	91
	9·63	95
	10·09	103
	9·29	106
	9·10	112
	8·92	117
Calved 8 a.m., sample taken 10 a.m.	9·40	124
Attacked with milk fever 7.30 a.m., sample taken 10.30 a.m.	6·56	125
Sample taken 2.10 p.m.	5·68	125
Sample taken 9.30 p.m.	6·56	125
Recovered, sample taken 6.30 a.m.	11·65	126
No recurrence, sample taken 4.45 p.m.	12·35	126
No recurrence, sample taken 10.30 a.m.	10·00	127
No recurrence.	10·50	129
No recurrence.	9·49	156
No recurrence.	10·39	181

5. *Addition of Calcium to the Blood during the Puerperium.*—One might reasonably expect that if one could maintain a high concentration of blood calcium by the repeated injection of a readily assimilable salt into the blood during the first 72 hours after calving, the disease should be prevented.

Now, the increased blood calcium concentration which follows intravenous injection is of a transient nature, but subcutaneous injections are slowly and continuously absorbed, and it may be expected that a single subcutaneous injection should maintain an increased blood calcium concentration for about 20 hours. It would therefore follow that were the newly calved cow to receive an appropriate dose of calcium gluconate (Sandoz) subcutaneously and were this to be repeated in, say, 24 hours, the critical period might be safely passed.

The following case may be instanced as an example :—

The test subject was a pedigree shorthorn cow, pregnant with her eighth calf. She had been attacked with milk fever at each of her last five successive parturitions. The following table briefly describes her history during the eighth puerperium :—

Table V.

	Remarks.	Mgms. Ca %
64 hours before calving ...		10·41
7 hours after calving ...	Symptoms suggestive of milk fever now evident. Given 20 gms. calcium gluconate (Sandoz) in 200 c.c. water subcutaneously.	7·87
12 hours after calving ...	Apparently normal.	10·19
17 hours after calving ...	Apparently normal.	
34 hours after calving ...	Symptoms suggestive of milk fever returned. Given 20 gms. calcium gluconate in 200 c.c. water subcutaneously.	7·02
55 hours after calving ...	Apparently normal.	
60 hours after calving ...	Apparently normal. Given 20 gms. calcium gluconate in 200 c.c. water subcutaneously.	8·01
About 4 weeks after calving	No recurrence.	10·20

It will be seen that at the seventh hour after calving the calcium value fell below 8 mgms. per cent. and the prodromal symptoms of milk fever developed. These, however, quickly disappeared after the calcium injection and five hours later when the cow was next seen by the practitioner she was apparently normal. At the 34th hour after calving the blood calcium value fell to 7·02

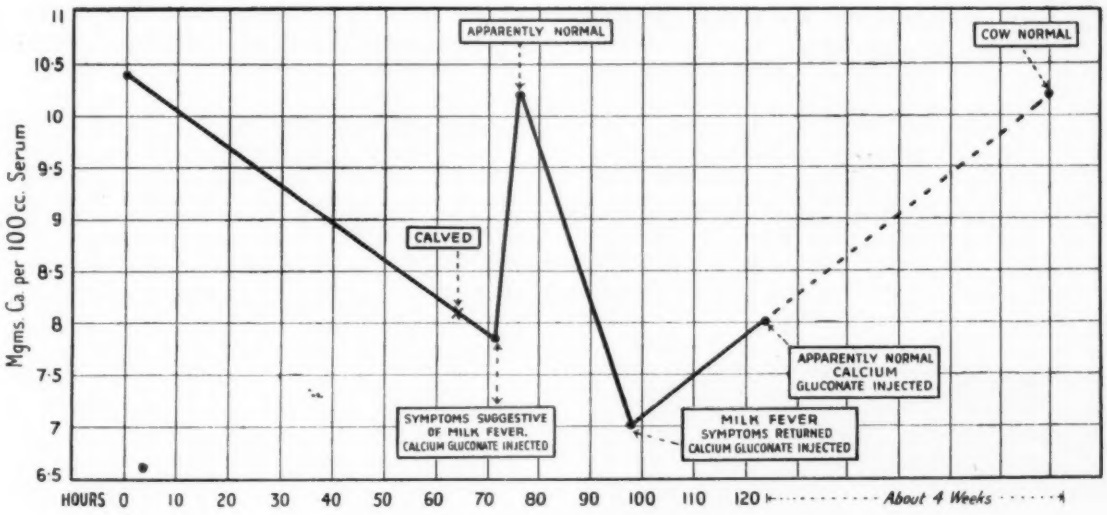


Fig. 4.

and the symptoms returned, but on another injection of calcium gluconate being given the case again recovered rapidly. A third injection of calcium was given at the 60th hour and no recurrence was noted.

It may be reasonably concluded from this experiment that an adequate injection of calcium gluconate immediately after calving should raise the blood calcium sufficiently high to prevent an attack, but since there is a possibility of a decline in the calcium value occurring in about 24 hours, another injection at that time would probably ensure the cow's passing safely through the susceptible period.

SUMMARY.

Introductory.

A.—In a study of 82 cases of milk fever it was found that the disease is invariably accompanied by a pronounced fall in the blood calcium values. This finding has been controlled by an examination of 34 normals and 81 cases of bovine disease other than milk fever.

B.—Inflation of the udder produces a rapid and regular rise in the blood calcium values, and this rise is concurrent with, and bears direct relation to, the disappearance of the symptoms of the disease.

C.—Injection of calcium gluconate elicits specific curative response in milk fever.

D.—It is concluded that the essential nature of milk fever is acute calcium deficiency.

E.—The salient features of calcium metabolism are discussed.

On Preventive Measures.

1.—It is considered probable that the occurrence of the disease may be partially controlled by ensuring an adequate supply of calcium in the ration, but on the available data no definite conclusion can be formed.

2.—While the injection of preparations of the parathyroid glands is unlikely to eventuate in a method of prophylactic value, the simultaneous injection of parathyroid principle *plus* calcium gluconate may yet prove a practical measure.

3.—The hitherto empirical method of prevention, which consists in allowing the udder to remain firmly distended with milk for the 72 hours succeeding calving, may now be regarded as rational in that it prevents the *sudden* transference of large quantities of calcium from the blood to the milk. This procedure, however, is uneconomical.

4.—The effect on the blood calcium concentration of massive repeated doses of vitamin D is discussed. The observations suggest that the disease may be prevented by this means by commencing vitamin D administration about five days before calving.

An important general principle governing the counteraction effects of the calcium-controlling mechanism upon sudden alterations of the normal blood calcium level appears to have emerged.

5.—The subcutaneous injection of calcium gluconate can abort the milk fever attack. Evidence is submitted that calcium injection immediately after calving and preferably reinforced by a second injection about 24 hours later would prove a preventive treatment.

Acknowledgements.

The writer desires to record his sense of gratitude for the valuable services rendered by his collaborators.

Mr. W. Kendrick (Tarvin) undertook the collection of the long series of blood samples discussed in Table IV and supervised the vitamin administration.

Mr. Oscar Stinson (Appleby) carried out the experiment designed to test the preventive effect of calcium injection.

These services were offered voluntarily and are thus the more warmly appreciated.

Laboratory and other facilities were afforded by the Royal (Dick) Veterinary College, Edinburgh.

Thanks are also due to Messrs. Sandoz, Wigmore Street, London, and to Messrs. Joseph Nathan & Co. (Glaxo and Ostelin), Osnaburgh Street, London, who, respectively, provided gratuitous supplies of Calcium Gluconate and Ostelin for use in the experiments.

References.

(1) Greig, J. R., *Vet. Rec.* 1930, x, 115.

(2) Sjollema, B, *Tijdschr. Diergeneesk.* 1928, lv., 1017.

The above paper forms part of a general investigation on milk fever which the author is prosecuting in collaboration with Professor Henry Dryerre and Dr. N. C. Wright, by the aid of grants received from the Development Commission, and the Highland and Agricultural Society of Scotland.

The German Veterinary Services during the Great War.

(From a Correspondent.)

The publication by you of Professor Leclainche's review of the official German report on the above subject is, it is submitted, at the present time, opportune, in view of the general resuscitation of interest in matters connected with the War, following upon a period, immediately after the stress of circumstances arising during the War, when discussion of such matters was considered irritating and irksome. The revival of interest has also coincided generally with an output of illuminating literature, in the form of official publications or works of fiction, emanating largely from erstwhile enemy countries, which often throw a very different light on subjects as they occurred or were presented to us in the course of the War. In general, new light has been thrown on the question of the preparedness of Germany for the class of warfare which actually supervened and upon the much vaunted efficiency of the German systems of organisation. Obsessed as we were at the time with the reputed efficiency of the German character and the might of the enemy onslaught, we were somewhat inclined to dwell unduly on our own shortcomings, pending the, not always too certain, advent of victory.

As things now transpire to have been, when we can examine them in the cool light of history, we had often no ground for any despondency in regard to our supposed shortcomings. So far as the contribution of our own profession in this country to ultimate victory was concerned, we now see that we were infinitely ahead of our adversaries, as well as of our allies, in preparedness—in matters of organisation, personnel, and equipment—not that we ever contemplated warfare of this magnitude. We had already had our lessons in the South African War, and those who wish to study the development that led up to the admirable veterinary organisation which we had in being at the outbreak of war are commended to a close perusal of that magnificent piece of historical research—*The History of the Royal Army Veterinary Corps*, by the late Sir Frederick Smith (himself one of the greatest contributors to the development of the organisation). Hence resulted the scheme of things whereby we had at the actual outbreak of war an organisation to deal effectively with sick and disabled animals in the field—an organisation that was, moreover, capable of infinite expansion and of absorbing large numbers of civilian veterinary surgeons recruited to the work, to undertake promptly all the tasks demanded of it without breakdown.

Although the chief actors in the War drama are now fast disappearing, we have, happily, still alive amongst us most of those who played the most prominent parts in the scene of veterinary endeavour. It must provide them now with much comfort to find that their stage was so much better set for their endeavour than it was in any of the enemy or allied armies.

The story in many ways makes surprising reading. The achievements of German veterinary science must be held to be second to none in the world, and even now, after the terrible vicissitudes of the War, the contribution of the German school to the progress of our calling excites our profound admiration. And yet, we find that at the outbreak of war what we came to regard as commonplace essentials of veterinary organisation, such as mobile veterinary sections, were utterly lacking in the German army. The tone of the Report, notably the tone of the lessons said to have been disclosed by the experience of the War, betrays a certain lack of power and authority, quite at variance with that exercised by the British veterinary service. We may allege, perhaps with good reason, that the different state of affairs was attributable to the inherent British genius for organisation—to their capacity for genially making the best out of all that was available, in men and material, and, what is probably merely a repetition of the same statement, to the degree of independent power conferred upon or acquired by the British veterinary officer, considered, as this was, to be a prime essential, that would brook no interference from other departments, if he was to undertake the responsibilities of his calling.

Whilst we may thus derive great satisfaction from the knowledge that we had made such superior arrangements for dealing with the main practical tests of the War as they arose, we must restrain ourselves a little, to ponder whether with all the opportunities that were available, with the degree of power conferred upon our veterinary services, the best that could have been done was always done. In particular, we may reflect that the best was, perhaps, not done, with the immense resources placed at our disposal at the time, in the elucidation of certain long-standing problems in equine disease (such as the group of respiratory affections), which cannot again be so readily attacked with the relatively niggardly facilities placed at the disposal of veterinary research workers for this class of research in time of peace. We note that the German authorities made an attempt to prosecute in a co-ordinated manner this aspect of their duties by the appointment of a Technical Director of Veterinary Services.

It is not for us to say whether the lessons derived from the experience of the veterinary services during the Great War have already become obsolete. But whether the last war was indeed "a war to end war," or whether we shall sadly awaken some time again to realise that war acts as a salutary and necessary purgative to the human race, we may conclude that the lessons learned by the veterinary services of the combatant armies on both sides were essentially of the same order; we had had certain severe lessons of the same kind from a relatively recent war, and we can justly credit ourselves with having had the wisdom to benefit from them. But there is another melancholy thought, which entered our mind with much poignancy after reading the introductory chapter of Sir Frederick Smith's historical work, already quoted. It is that the admirable system of army organisation to which have contributed some of the best brains and characters in our profession must now become largely arrested in its development and is in danger of becoming obsolete through the supervention of a different set of phenomena, namely, the replacement of the horse by mechanical forms of transport. Thus it seems that, as it is in the affairs of the human individual, with the progress of time, armies, and nations, have to purchase their experience, dearly, afresh. As the great French cynic, La Rochefoucauld, wrote: "*On arrive tout nouveau à cheque âge.*"

Clinical and Case Reports.

Some Uncommon Pathological Conditions met with in Poultry.

By Norman H. Hole and Harvey S. Purchase, Ministry of Agriculture's Laboratory, Weybridge, Surrey.

We have been somewhat diffident in presenting an account of some pathological *post-mortem* findings met with in the course of routine examinations of fowls. The paucity of literature on Poultry Pathology has made it difficult to produce an article other than a simple record of our findings, together with suggestions as to the possible nature and cause of the changes. We hope that the photographs will serve to make the cases interesting.

I.—A Diverticulum of the Gizzard, with Impaction. Perforation and Peritonitis.

Subject.—A White Wyandotte pullet, nine months old, in good condition.

Post-mortem Findings.—The first abnormality noted, on opening the abdominal cavity, was a fibrinous peritonitis. There was also present a small amount of straw-coloured fluid. The fine fibrinous deposit was evenly and diffusely spread over the whole of the surfaces of the abdomino-thoracic cavity. When the organs were removed for more particular examination a finger-like appendage, five centimetres long and two centimetres in diameter, was found attached to the posterior pole of the gizzard. It was very tightly impacted with stones and gritty material. Stones and grit are normally found in the gizzard, but these were impacted so closely and firmly in the diverticulum as to appear like one solid mass.

The thin walls of this diverticulum consisted of the stretched cornified membrane of the gizzard, together with its serous lining. Examination of the inside of the gizzard showed, at the entrance of the diverticulum, some necrotic tissue firmly adherent to the orifice. This is plainly shown in the photograph.

The whole diverticulum was of a bluish colour, and showed very advanced putrefactive changes, more so than any other part of the intestines. Closer examination revealed that one of the sharp stones at the extreme tip had been pressed tightly against the wall, and had completely perforated it. It would seem that prior to death the diverticulum was probably a mass of gangrenous tissue.

Discussion.—The diverticulum described would appear to be comparatively rare. Lahaye (1) has recorded a case of "Rupture du gézier" in the fowl, but has given no description of his findings. Hughes (2) in his observations on an interesting case of foreign bodies in a fowl found that the objects had travelled through the posterior pole of the gizzard. This statement he proved by sections which revealed scar tissue. No other recorded case has been found in a cursory search of the literature. That this cul-de-sac should have become impacted is not surprising, when one considers the pressure that must be exerted whilst the strong lateral muscles of the gizzard are functioning. It seems possible that the strain led to a rupture of the posterior portion of the muscularis intermedii (Kaupp). This was probably a slow process and the ingesta and grit were pushed through the rupture to form the diverticulum. When the tissues could stretch no further, the pressure was so great that necrosis set in. This was complicated by infection leading to gangrene of the sac and general peritonitis when perforation was complete.

(1) Lahaye. *Annales de Méd Vét.* 1929. Vol. LXXIV, page 337.

(2) Hughes. *Vet. Journ.* 1927. Vol. LXXXIII, page 610.

Case I.

A.—Proventriculus. B.—Duodenum. C.—Diverticulum.

II.—Strangulation of the Small Intestine in a Fowl.

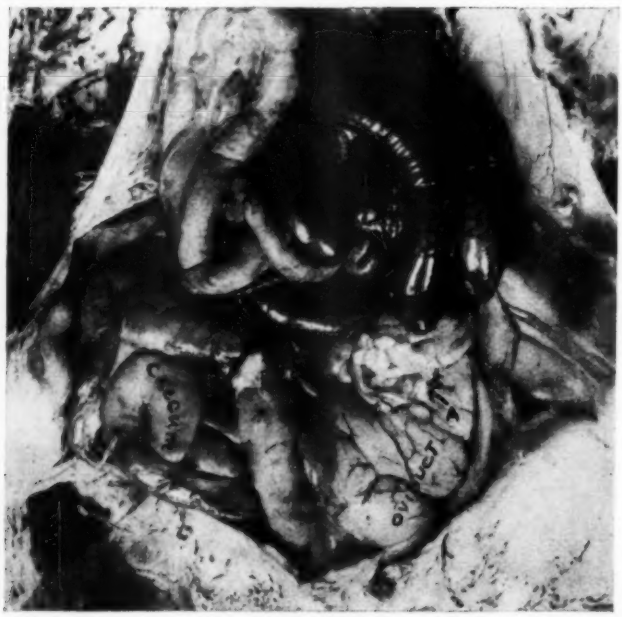
Subject.—A White Leghorn hen, sent from an egg-laying trial for *post-mortem* examination. The Trial Manager reported that he had removed a broken egg from the oviduct of the bird when alive. It appeared normal until the next day, when it dropped dead in the run.

Post-mortem Appearances.—The general condition of the bird was good. On opening the abdominal cavity, portions of the small bowel were seen to be very congested and slightly distended with gas. Some parts were bright red, others cyanotic. The large intestine, cæca and duodenum were normal. A cord of mesentery and mesenteric vessels about the thickness of fine string had become so tightly entwined around three distinct loops of small intestine as to close completely the lumen.

The oviduct was ruptured and showed an irregular tear half-an-inch long in the ventral surface.

No other abnormalities were noted.

Discussion.—It seems probable that the torsion resulted from the operative interference, and that the movements of the intestine served to increase the strangulation.



Case II.

Rupture of Oviduct (A) Also Showing Strangulation of Small Intestines.

III.—Intussusception of a Cæcum in a Fowl.

Subject.—A White Leghorn hen from a laying trial.

Post-mortem Examination.—The bird was in good bodily condition. The carcass showed a pedunculated ulcerating tumour, the size of a pigeon's egg, situated on the mid-line between the cloaca and the tip of the sternum. A second tumour of the same size, which easily shelled out, was present in the left pectoral muscles. Incision into both these growths revealed a greyish matrix with islands of brown cheesy material suggestive of blood undergoing absorption.

Examination of the abdominal cavity revealed a grossly enlarged liver weighing three-quarters of a pound. The liver was strawberry coloured and showed many small grey areas distributed throughout its substance. The omentum and mesentery showed a diffuse thickening with many nodular elevations of the size of a split pea, which were also present on all the alimentary organs.

The right cæcum showed an intussusception in its lower third, close to the ileo-cæcal junction. This was apparently of some considerable standing, as adhesions had occurred between intussuscepted portions. The upper or unattached portion of the affected cæcum was only about half the diameter of the same part of the unaffected cæcum.

Microscopic Examination.—Examinations of sections revealed the new growths to be sarcomata of the large-round-celled type. There was considerable nuclear activity and mitotic changes were well marked in all the fields.

Sections of the large pendulant tumour revealed central areas of necrosis. Was this the oldest lesion and the primary seat? The growth embedded in the pectoral muscle showed a tendency to invade the surrounding muscular tissue.

The liver revealed a very widespread damage to its parenchyma. The neoplasm appeared to have propagated along the blood vessels, as in section most vessels were surrounded by a circular affected area, and in some instances the blood vessel wall itself appeared to have been attacked.

The whole of the mesentery showed a diffuse sarcomatosis, with larger foci which appeared to the naked eye as white glistening nodules the size of a split pea. The intestinal wall was also invaded and there were neoplastic changes between the intestinal glands.

Remarks.—This type of generalised tumour formation invading the mesenteric membranes is not rare in fowls. A good discussion and summary of cases of intussusception in the domesticated animals is given by Corner (1), but no mention of avian intussusception is made.

Whether this intussusception was due to or directly associated with the neoplasm is difficult to decide. From observations on many cases of neoplasmata affecting the peritoneal membranes and viscera of the fowl, this is the first we have seen to show an intussusception.

(1) Corner. *J. C. P. & Th.* 1903. XVI. pp. 151 and 225.

Case III.

Showing Intussusception (A) of Cæcum and also Neoplastic Changes in Mesentery.

IV.—Impaction of the Rectum of a Fowl.

Subject.—A White Leghorn pullet from egg laying trials.

Post-mortem Findings.—The most obvious feature, on inspecting the carcass, was a large growth along the right pectoral muscles, the size of a tennis ball. The hen was in a very poor condition, showing marked general muscular wasting. Incision into the new growth revealed a whitish glistening matrix. It had the consistency of well-set brawn, and contained many foci of yellow necrotic tissue.

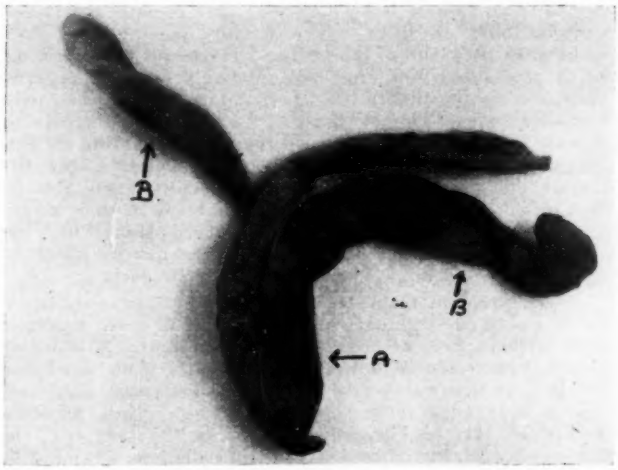
On opening the abdominal cavity, the rectum, cæca and ilium were seen to be grossly enlarged and of a blue-black colour. Closer inspection showed these to be impacted with fæcal matter of normal consistency.

No other changes were noted. There were no metastases of the breast tumour. The kidneys and ureters were normal, so that the stoppage of the rectum did not appear to have interefered with their functions.

Microscopic Examination.—The growth was a large-round-cell sarcoma showing many mitotic figures.

Remarks.—The cause of the impaction seemed to be general debility and consequent inertia of the intestines. There was no sign of an obstruction. The

general debility was almost certainly due to the neoplasm sapping the general health of the bird.



Case IV.
Showing Impacted Rectum (A) and Impacted Cæca (B).

V.—Tuberculosis of the Myocardium of a Fowl.

Tuberculous lesions in this position were observed in a Rhode Island Red hen. The specimen was not markedly emaciated, but *post-mortem* examination revealed numerous tuberculous foci, of the coarse granular nature frequently met with in fowls, distributed in the substance of the liver. Smears made from these lesions revealed an abundance of acid-fast bacilli. No macroscopic lesions were observed in the spleen or bowel, but the heart wall showed numerous whitish spots, varying in size from that of a pin's head to that of a millet seed.

Sections of the heart wall were made, and stained with hæmatoxylin and eosin. Their histological appearance showed typical tuberculous inflammatory changes. Epithelioid cells were very plentiful, but a careful examination failed to discover the presence of giant-cells. Many acid-fast bacilli were demonstrable in sections stained by the Ziehl Neelsen method.

Discussion.—Tuberculosis of the heart wall of fowls would appear to be infrequent, but not unknown. Hutyra and Marek (1) mention the myocardium as an occasional seat of tuberculous lesions. Vosgien (2), however, in his statistics on the localisation of tuberculous lesions in birds, makes no mention of the heart.

It is worthy of note that the writers have commonly heard the view expressed that tuberculous lesions in the lungs of the fowl are rare. The lungs are, however, frequently affected, but the lesions are often so minute as to be easily overlooked. Vosgien, indeed, states that in 145 cases examined by him, 42 per cent. showed tuberculosis of the lungs.

(1) Hutyra & Marek. *Spec. Path. & Ther. of Dis. of Domest. An.* Vol. 1. page 730.

(2) Vosgien, *cited by Hutyra & Marek.* Vol. 1. page 731.

Tuberculosis is considered to be the gravest of the three great problems of cattle breeding in Germany. The other two are mastitis and contagious abortion.

Abdominal Cysts in Hens.

By G. O. Davies, B.V.SC., M.R.C.V.S., D.V.H., Department of Veterinary Pathology, University of Liverpool.

In the "*Veterinary Record,*" No. 7, Vol. 10, 1930, four cases are recorded under the above heading. Inasmuch as these cases are recorded from Pretoria, I should like to add that an apparently similar condition has been encountered in the course of an investigation conducted at the above laboratory.

In the course of an enquiry as to the cause of deaths on a poultry farm, several live pullets were secured for purposes of observation and laboratory examination. Bacillary white diarrhœa had previously been shewn responsible for deaths amongst chickens.

The clinical symptoms of the bird in question did not lead one to suspect a condition other than was thought to be present in the remainder of the poultry, but probably the fact that all had been sent in as suffering from the same condition masked this independent case.

The bird was killed for diagnosis and when being prepared for *post-mortem* examination, a very marked distension of the abdomen was apparent, in which there appeared to be a large fluctuating mass of the nature of a cyst. Although care was taken to try and open the abdominal cavity without interference with this cyst, I was not successful, and a clear straw-coloured fluid escaped. A few flakes of a white fibrinous material were found over the surface of some organs, more particularly the liver. There appeared to be at least three large cysts, occupying the whole of the abdominal cavity, and the total quantity of fluid could be estimated at a minimum of 200 c.cs. The cyst walls and contents were translucent and there was no intercommunication. With the exception of the liver, which had an atrophied appearance, the internal organs were apparently normal. Unfortunately a bacteriological examination was not made, but sections were prepared from the liver. Previous to the examination of these sections it was thought that it might be a form of ascites associated with a cirrhotic liver, but microscopical examination did not support this view. It rather confirmed the opinion that the liver condition was secondary, and that the atrophied condition was due to pressure from these cysts.

An Hereditary Lethal Deformity in Calves.

By Oscar Stinson, M.R.C.V.S.

During the last year the writer has encountered a number of deformed calves having partially extended and rigid limbs necessitating serious surgical intervention at birth. They were all in one district and were the results of a particular bull carrying the factor serving cows carrying a similar factor.

Portions of one of the deformed calves were sent to the Animal Breeding Research Department, University of Edinburgh. The workers there were very interested in the fact of this condition being met with in cattle, and it was stated that (so far as they knew) these are the first cases in the bovine to be put on record : hence this communication.

The writer met with the same condition in the sheep three years ago.

. . . . . .

The Condition in Lambs.

Note by the Editor.—In a recent issue of *The Journal of the Ministry of Agriculture* there appeared an article by J. A. Fraser Roberts, M.A., B.SC., F.R.S.E., of the Animal Breeding Research Department, University of Edinburgh, entitled "An Hereditary Lethal Deformity in New-born Lambs." We reproduce the following extracts:

The Inheritance of the Defect.—The studies that have been made so far indicate clearly that the condition is hereditary. This is shown by the fact that in nearly every case where the affected lamb is a twin the other twin is entirely normal. In the flock where the majority of cases have been observed, some forty during four seasons, it has been possible to work out the ancestry of the parents and thus obtain some information as to the method of transmission. Where an affected lamb is produced, the defect has been transmitted through both parents, and, in fact, although the data are not yet sufficient for certainty in the matter, there is good reason to believe that the condition is the result of the operation of a single recessive Mendelian factor. The consequences of this mode of inheritance are that a sheep of either sex may bear a single dose of the factor, and, as it is recessive, such a sheep is normal. When two animals, both of which carry the factor, are mated, the expectation, on the average, will be one deformed lamb, which carries a double dose of the factor, in every four. Further, of those that are normal to all appearance, two out of every three on the average will carry the single dose of the factor producing the defect. If a "carrier" is mated to a normal sheep, half the progeny will also be carriers.

The lessons to be learned from these facts are sufficiently clear. Any sheep, ram or ewe, that is the parent of a deformed lamb should not be used for further breeding, and the normal offspring of such a pair known to have produced deformed lambs should also be eliminated, or, at least, should be discriminated against in culling, as the chances are two to one in favour of any sheep being a carrier. If in any flock the defect were to occur regularly and rams were used which did not sire any affected lambs, though ewes of the stock mated to them had previously done so, such rams could be assumed to be free, and it might be possible to continue their use for some time. The effect of this would be to decrease the number of carriers in the flock.

On the assumption that the defect depends upon a single recessive factor, the highest proportion of affected lambs that could occur, even if every ram and every ewe were a carrier, would be 25 per cent. Normally the proportion would be far lower than this unless it so happened that some specially desirable individual or individuals that were carriers were chosen as the basis for line-breeding. In such a case the incidence of the defect might increase alarmingly and even approach the maximum 25 per cent. unless the position were realised and appropriate steps taken. Even a comparatively low percentage is a serious matter, however, in view of the difficulties attending labour and the resulting high rate of mortality amongst the ewes bearing these lambs. As stated above, it is probable that the mode of inheritance is of the simple type discussed, but even if further study should show that the matter is more complicated, the basic fact remains on which must depend any measure of control, *viz.*, that *both* parents are responsible.

Lethal Factors.—The case described is an excellent example of the operation of what are called "lethal factors." Such factors are hereditary Mendelian units which are transmitted according to known laws and which in certain combinations give rise to an animal so abnormal in structure or function that it cannot live. These factors may exert their influence at various periods during the life of the animal. They may act, as in the present case, by causing death about the time of birth. In other cases the animal may live for a short time and then inevitably die. On the other hand, lethal factors may cause death at various times between conception and birth, and there are strong reasons for supposing that a low fertility caused by abortion (abortion at a very early stage could not be recognised as such and would be described as barrenness) may often be due to the action of lethal factors. This is particularly the case in those instances where fertility is stated to have suffered as the result of inbreeding. The result of inbreeding is to produce strains that are relatively pure as regards their hereditary constitution. Lethal factors are necessarily recessive when simple in their action, and increasing genetic purity will unmask such factors by isolating strains including a large proportion of animals which carry the double and fatal dose. Semi-lethal factors must also be recognised. As the name indicates, the result of their action is not invariably fatal, but they act by shortening the duration of life, or by causing such derangement that the animals affected are peculiarly liable to die early.

It is certain that the operation of lethal and semi-lethal factors plays a large part in the breeding of farm animals, and is the source of considerable loss, and it is probable that further research will show that losses from this cause are greater than can yet be estimated. The control of losses due to this cause must be sought in appropriate breeding procedure. It is certainly far better to prevent the appearance of the deformed and unfit than to attempt the difficult or often impossible task of subsequent cure, to say nothing of the fact that a cure, even if successful, will result in the multiplication of the undesirable type. The elucidation of a problem involving lethal factors is usually comparatively simple from a scientific point of view, and there is probably no field where the science of heredity can so rapidly and effectively bring material aid to the breeder of farm stock.

It may be useful to give a few examples of lethal factors and their mode of action. In cattle a very well-known case is that of the so-called "bull-dog" calf occurring in certain breeds. (Crew, 1923.) A very similar condition has been described in the Norwegian Telemark breed by Wriedt (1925). It is probable that the occurrence of bull-dog calves is due to a simple recessive factor; a similar but not identical condition is known to occur in sheep. In the Friesian breed a condition has been described (Hadley, 1925) in which the calves are born devoid of skin on the legs, ears, and mouth, and die within a few days or weeks of birth. This condition is again due to the action of a simple recessive factor. Detlefson and Yapp (1920) describe a case of congenital cataract in cattle that apparently also acts in the same way.

In horses an "eyeless" condition is known; it is definitely hereditary, and as the chances of survival of a blind foal are necessarily slight, it is fair to describe this as at least a semi-lethal. A similar defect is known to occur in other species of animals, including the sheep. Wriedt (1925) has described a genetic form of sterility in the Danish white horse, the result of the action of a lethal factor. Crew (1925) demonstrated two remarkable lethals in fowls. One is the Frizzle breed, in which the feathers are curled round to give the characteristic fuzzy appearance. Frizzles never breed true, but always give off-spring in the proportion two Frizzles, one plain-feathered, and one which dies in the shell. A factor, acting in precisely the same way, is frizzling, but the double dose is lethal and causes death in the shell. A factor, actng in precisely the same way, is responsible for the "Scots Dumpie." Dunn also describes a lethal factor in fowls the effect of which is to cause death at an early stage. Lethal factors are also known in dogs. One which occurs in the bull-dog and depends upon a recessive factor causes puppies to be born with a cleft palate. As they cannot suckle, they soon die (Wriedt, 1925).

It might be mentioned in conclusion that in *Drosophila melanogaster*, the fruit fly, about whose inheritance more is known than of that of any other animal, the number of lethal factors that have been discovered is over forty; and there is no doubt that, with increasing knowledge of the heredity of farm animals, the wide distribution and importance of lethal and semi-lethal factors will become more evident, and, at the same time, there will emerge the knowledge that will lead to the control of the losses caused by them.

Abstracts.

[**The Diagnosis of Lung Worm Invasions in Cattle and Sheep.** Wetzel, R., *Deutsche Tier. Wochschr.*, 1930, 38, 4, 49-50.]

It has been shown by Schoop that, in the fresh fæces of animals infected with lung worms, only the larvæ, and not as stated in most text books the eggs, of lung worms, are to be found. A large number of the larvæ of *Dictyocaulus vivaprus* and *D. filaria* pass into the lungs after the eggs are laid and may be swallowed with, or coughed out in, the sputum. The number of lung worm eggs found in the intestinal tract of cattle and sheep decreases from the stomach caudalwards; in the cæcum, only larvæ are found. All nematode eggs appearing in the fæces of cattle and sheep have origin, therefore, in intestinal parasites.

The apparatus (a modification of that employed by other workers for other purposes) used for the demonstration of lung worm larvæ is as follows:—

A 9 c.cm. wide glass funnel, to the stalk of which is attached, by means of a piece of rubber tubing, a pointed portion of glass tube. The rubber tubing is closed by means of a clip. In the funnel is placed a fine wire sieve and over this are laid one or two layers of fine muslin. The fæces to be tested are placed on the muslin, and water, at between 30°-35° C., is added, so that the bottom quarter of the sieve is covered. In from three to six hours the larvæ pass into the water. These fall to the lower portion of the funnel, and may be obtained for examination by releasing the clip, allowing a small quantity of fluid to escape into a Petri plate and examining under the low power of the microscope.

One may simplify the method by placing the fæces in a double layer of muslin and suspending this in the water-filled funnel.

J. H. M.

[**Disinfection Experiments with the Virus of Swine Fever.** Miessner, H. & Geiger, W., *Deutsche Tier. Woch.*, 1930, 38, 1, 1-10.]

The authors recall Uhlenhuth's and his co-workers' experiments on the effect of various disinfectants on the virus of swine fever, the virus being contained in the defibrinated blood, serum or urine of infected pigs. The material under test was mixed with the virus-fluid, allowed to act for a certain time and the whole injected into susceptible swine. The authors note that there is the possibility that the chemical agent could continue its deleterious affect on the virus whilst in the animal body.

A considerable number of disinfectants were tested by the authors in the above manner, with the result that the virus appeared to have little power of resistance. This could be due to the substance acting for a further indefinite time *in vivo* and further, to obtain the required concentration of antiseptic, it was always added in double strength to an equal volume of virus-fluid. They decided to use small thin sections of kidneys, beset with petechiæ, obtained from virus-infected pigs. The fragments were placed in the required concentration of disinfectant, left at room temperature for the requisite period, thoroughly washed in running water and further left for some time in water. Finally they were cut up, ground in a mortar with distilled water and about 10·0 c.c. of the resulting suspension injected subcutaneously into swine.

(1) *Chlorinated lime.*

This was used diluted (1 litre to 20 litres of water) and must be freshly prepared and must give off the chlorine odour. Tested in the manner described, only a slightly "weakening" effect could be ascribed to it, the virus not being killed after one hour's contact.

(2) *Cresol soap solution* (6 per cent).

This was firstly allowed to act for 15 minutes, but swine injected with the so-treated kidney fragment died in the same way as the controls. In five further experiments, the disinfectant was permitted to act for one hour, but in no instance was the virus killed with certainty. However, cresol soap solution did weaken the virus, in that symptoms appeared at a later date than in the controls; in one experiment, 11 days after the first signs of disease in the controls.

(3) *Cresol-sulphuric acid* (3 per cent.).

The virus was not killed in one hour.

(4) *Formalin.*

Two per cent. formalin in one hour and a 2·5 solution in half-an-hour did not kill the virus. However, the stronger solution, acting for one hour, had a definitely inhibiting effect, the test pigs showing symptoms at a much later date than the controls.

(5) *Caporit* (a preparation of the I. G. Farbenindustrie).

Consists of calcium hypochlorite, and contains at least 70-75 per cent. of effective chlorine. In 2·5 per cent. solutions the substance did not destroy swine fever virus in one hour. As Steidle has shown that dilute solutions have a more destructive action on the virus of foot-and-mouth disease than more concentrated solutions, the effect of a 0·05 per cent. solution acting for half and one hour was tried on the virus of swine fever. No destructive effect was noted.

(6) "*Raw*" *Chloramin* (a preparation of the firm of Heyden, which depends for its action on the evolving of chlorine).

The concentrations used varied from 0·1 per cent.-7·0 per cent. and the time from one-quarter to two hours. The lower concentrations acting for a short time were ineffective, but there was evidence that the stronger solutions had a definite inhibiting effect on the virus, particularly the 7 per cent. concentration acting for two hours, but even in this instance the virus was not absolutely killed.

(7) *Sulfoliquid* D.S. (a sulphurous acid preparation prepared by the Chemical Works, Marienfelde).

Good results have been reported on the viricidal effect of SO_2 preparations on the virus of foot-and-mouth disease.

In a 5 per cent. concentration and acting for from one-quarter to 5 hours no killing action on swine fever virus was noted. After six hours, a decidedly inhibitory effect was produced, but even in this instance the virus was not fully killed.

(8) *Caustic soda solution and Duramin.*

(*a*) Caustic soda solution: Experiments have shown that such substances as caustic soda (1 per cent.-2 per cent.) and antiformin (1 per cent.) which do not coagulate albumen, have a decided viricidal action on foot-and-mouth disease virus.

In the experiments with swine fever virus chemically pure sodium hydrate, dissolved in distilled water, was used. The effect of soaking kidney fragments in soda solution was to cause them to swell up and become smooth and glossy so that rubbing up in a mortar was a matter of difficulty.

With 0·5 solution, acting for 15 and 30 minutes, no viricidal action was obtained. With 1 per cent. solution acting for half-an-hour, a decided "weakening" of the virus was produced, but with 2 per cent. for one-quarter of an hour the experimental swine died as the controls. The 2 per cent. solution acting for half-an-hour so lowered the virulence of the virus that only a transitory slight illness was produced, which led to immunity. Acting for one hour the 2 per cent. solution so weakened the virus that in one experiment only transitory illness was produced. In another experiment the experimental pigs sickened at a much later date than the controls. A 3 per cent. solution in one hour allowed the virus to produce symptoms 11 and 5 days (two pigs) after those in the controls. These two swine proved immune to infection at a later date.

(*b*) Duramin (prepared by Chemical Works, Marienfelde).

This is a powder containing caustic soda and calcium hydrate. A 4 per cent. solution in water contains 1 per cent. caustic soda. It has better keeping qualities than soda solutions and is less harmful. It further contains varying quantities of chlorinated lime and in water gives off sodium hypochlorite.

The results of using 4 per cent.-7 per cent. solutions acting for one and two hours were similar to those obtained for caustic soda solutions. The virus was greatly reduced in virulence but never absolutely killed. Of all the preparations used, 2 per cent. caustic soda solution, acting for one hour, has given the best results.

(9) *Various preparations.*

A few experiments were put up on a small scale with a number of less well known preparations.

(*a*) Glawelin (named after Glawe, its discoverer). A 5 per cent. solution in one hour did not kill the virus.

(*b*) Kerol M.O.H. (prepared by A. Ziegler, Zürich, and contains about 50 per cent. tar oils and about 25 per cent. phenol, soap and water). A 2 per cent. solution acting for two hours did not destroy the virus.

(*c*) Multisept (consists of a mixture of organic acids with chlorinated lime). In solution in water hypochlorous acid is formed and also calcium salts. No viricidal or even inhibitory effect on swine fever virus was produced by 2 per cent. solution acting for one hour.

Conclusions.

The method formerly employed of mixing the virus-containing-fluid (blood, urine) with the disinfectant, does not place a true value on the material, as it must be injected along with the virus into the animal body and can there act for a further undetermined time.

Using the method described, the disinfectants tested failed to kill the virus of swine fever in one hour. This may be due to the albumen-coagulant effect of most disinfectants, a protective covering being provided for the virus. Of the materials tried, 2 per cent. caustic soda solution has given the best results.

J. H. M.

Reports.

Annual Administration Reports of the Bombay Veterinary College, Bombay City and Harbour Veterinary Department and Civil Veterinary Department (including Sind)

For the Year 1928-29.

As usual, the reports of the various departments are included in one publication. The report of the Bombay Veterinary College is a record of satisfactory work.

There were 95 students, including representatives from the Central Provinces and from Ceylon. Considerable diagnostic work was performed in the College Labaratory, and the treatment of surra by means of "Bayer 205" was tried with success.

The Harbour Veterinary Department inspected nearly 3,000 animals imported under the Live Stock Importation Act.

There was an increase in the mortality from cattle disease both in the Presidency of Bombay and in Sind during the year, and extensive preventive measures were conducted.

A feature of the Bombay report was the prevalence of black-quarter and the protection of animals with aggressin, combined in certain outbreaks with black-quarter serum. In both Bombay and Sind the treatment of rinderpest by iodine injection was reported to have given satisfactory results.

The attendance at the Veterinary Dispensaries showed a substantial increase and work on tour was satisfactorily maintained.

Horse breeding operations in both Bombay and Sind are local enterprises and are not very flourishing.

Cattle breeding apparently does not come within the scope of the veterinary departments.

Whilst appreciating the work of the veterinary departments in Bombay and Sind, the Government of Bombay recognise the need for expansion, but regret that, owing to financial stringency, no further progress is at present possible.

Annual Report on the Working of the Civil Veterinary Department of the Central Provinces and Berar

For the Year ending March 31st, 1929.

The year 1928-29 was marked by an increased mortality from cattle disease, rinderpest being especially prevalent. The activities of the department in this connection surpassed all previous records and, in spite of shortage of staff, preventive measures were instituted in a vast number of outbreaks. Prejudice against inoculation is being gradually overcome. The need for legislation to deal with the movements of infected herds is referred to and this difficult problem is under the consideration of the authorities. The growing popularity of the treatment of Piroplasmosis by trypan blue solution issued by the Department

and the extensive adoption of preventive treatment for black-quarter are indicative of progress. Fowl cholera and spirochætosis in poultry were prevalent and were dealt with by serum inoculation and soamin respectively. Laboratory work during the year increased very greatly and improved accommodation is under consideration. The number of dispensaries in the Province was 100 and the attendance was increased.

Cattle breeding operations in the Province are conducted by the Agricultural Department, but the officers of the Veterinary Department pay regular visits to the farms and give advice on professional matters.

A large number of castrations are carried out by the Burdizzo method, which is gaining confidence. Propaganda work is being developed at cattle fairs by lectures and demonstrations.

The report is a record of good progress in a year of considerable strain, and Major Stirling, the Veterinary Advisor, and his staff, receive the well-merited appreciation of the local Government for their keen and energetic work.

1930—Still Going Strong!

Professor James Macqueen, F.R.C.V.S.

Professor E. Simpson Shave, F.R.C.V.S., M.R.C.S. (Eng.), L.R.C.P. (Lond.).

Divisional Reports.

Eastern Counties Division, N.V.M.A.

Annual Meeting at Norwich.

The Annual General Meeting of this Division was held at the Royal Hotel, Norwich, on February 28th, 1930, with the retiring President, Major T. G. Heatley, O.B.E., M.R.C.V.S., in the chair. There were also present:—Capt. V. Boyle, Mr. J. M. Buchanan, Professor J. B. Buxton, Messrs. W. F. Howes, G. T. Matthews, J. Reid, H. P. Standley, Sen., H. P. Standley, Jun., Capt. J. F. Thurston and Colonel W. A. Wood (Hon. Secretary), with Mr. W. H. Dennett as a visitor.

The minutes of a previous meeting of the Division, having been published in the *Veterinary Record*, were taken as read and were confirmed and signed.

Correspondence.—(1) From Capt. H. R. Allen, Capt. T. J. Bosworth, Messrs. A. P. Burgon, E. A. Burgon, H. F. Downe, R. E. Glover, H. J. Loveless, W. F. Loveless, C. C. Nesling, V. Pride-Jones, H. L. Roberts, Capt. W. Shipley, Messrs. J. Smith, R. C. Taylor, P. Welch and W. H. Wortley, apologising for their inability to attend the meeting.

(2) From the N.V.M.A., requesting the curtailment of reports (forwarded for publication) of discussions on circular communications from the Association.

Accounts.—The next business was to receive the statement of accounts which, the Hon. Teasurer and Secretary (Col. Wood) explained, covered the years 1928 and 1929, as the accounts were not audited last year, owing to his indisposition, and they had a two-year audit in consequence.

The Balance Sheet revealed a satisfactory financial position, the balance at bank standing at £36 6s. 0d.

The President remarked that he noticed that entrance fees and subscriptions for 1928 amounted to £21, while those for 1929 were only £12 1s. 6d. He would like their Treasurer to explain that.

The Hon. Treasurer replied that when he took office at the beginning of 1928, a great effort had been successfully carried through to get in all outstanding subscriptions, so that the receipts for 1929 were inevitably small by comparison. This year he had sent out notices, which had met with a very satisfactory response. The expenses during the past year had not been heavy, and their finances were in an entirely satisfactory state.

Elections to Membership.—Mr. W. H. Dennett, of Fakenham and Mr. James Reid, of Norwich, were unanimously elected as members of the Division.

The West of Scotland Division's Scheme for the Eradication of Bovine Tuberculosis.

The Hon. Secretary said that at the last meeting of the Division, a committee, consisting of the President, Professor Buxton and himself, was appointed to consider the scheme and report to that meeting. The report of the committee was as follows:—

"Your Committee, having considered this scheme from many angles, consider that,

"A.—While the eradication of bovine tuberculosis is most earnestly to be desired, the great cost that would be necessary to work the scheme under consideration is so great that there is little likelihood of funds being available.

"Major Motton, at a meeting of the West of England Division, went into the figures and estimated that if a start were made with only three per cent. of the cattle of England and Wales, at least £300,000—£400,000 would be required and that a start on any smaller scale would be useless.

"B.—Next there is the question of the disposal of reactors. If testing was done on a large scale then the great number of reactors coming at the same time would be likely to reflect on the milk supply—if they were destroyed—seeing that from 40 to 60 per cent. of dairy cows might be expected to give reactions. On the other hand, if reactors were not destroyed but disposed of outside the areas, then many of the advantages of the scheme would be lost.

"C.—The scheme as it stands seems likely to cause great discontent to many owners and breeders.

"D.—At the present time this scheme is impracticable and the situation can best be met by

(*a*) Reviewing the Tuberculosis Order and the Milk (Special Designations) Order with a view to their amendment and extension.

(*b*) A more rigid enforcement of the Milk and Dairies Order, 1926.

"Your Committee is of opinion that the steps suggested above will meet the case as it stands at present better than the scheme under discussion; that these steps, together with careful and thorough disinfection of premises, should lead to an elimination of all cases of open tuberculosis, and that this would tend greatly to reduce the number of tuberculous animals and so pave the way for the application of such a scheme as that proposed by the West of Scotland Division."

The President: That is the report of the Committee, arrived after careful consideration of the matter from every point of view. I should like to have your observations upon it and expressions of your approval or otherwise.

The meeting resolved itself into Committee for the purpose of considering the report.

Upon the resumption of open meeting, the report was received and adopted, for forwarding to the Scottish Branch and the National Veterinary Medical Association, upon the proposition of Mr. Buchanan, seconded by Mr. Standley, Sen.

Election of Officers.

President.—Major Heatley said that he had great pleasure in moving, from the Chair, that Professor Buxton be asked to accept the Presidency during the coming year. (Applause.) It was a year of exceptional importance to the veterinary profession, inasmuch as it would witness the holding of the International Veterinary Congress, and they would all be delighted if, under such circumstances, they could be favoured with the leadership of Professor Buxton.

The election was made with enthusiasm, Professor Buxton expressing the pleasure with which he accepted their invitation to officiate as the Society's President.

Vice-Presidents.—The retiring President, Mr. W. Shipley and Mr. H. P. Standley, Sen., were unanimously elected.

Committee.—The following gentlemen were elected to serve:—Mr. V. Boyle, Major Castle, Messrs. Downe, Standley, Jun., Thurston, Turtill, Waters and Wortley, with the officers as *ex-officio* members.

Hon. Secretary and Treasurer.—The President expressed the hope that Colonel Wood would continue to serve the Society in that dual capacity. He had great pleasure in proposing accordingly from the Chair.

The proposition was seconded by Mr. Matthews and carried with acclamation.

Colonel Wood, returning thanks for his re-election, said that he would be pleased to carry on for another year, but he hoped that by the time their next annual meeting came round someone else would be prepared to fill his place.

Auditors.—Messrs. H. Buckingham and T. E. Barcham (re-elected).

Representatives to Council, N.V.M.A.—The Hon. Secretary is a member of the Council *ex-officio*, and the Division appointed Mr. H. P. Standley, Sen. (re-elected) and Mr. G. T. Matthews as its other representatives. In returning thanks for his re-election, Mr. Standley said that in his view no member should allow his name to go forward for election in that capacity who was not determined, by attendance at the Council meetings, adequately to represent the Division on the controlling body of the N.V.M.A. He had sometimes had occasion, when attending Council meetings of the N.V.M.A., to deplore the lack of representation of the Eastern Counties Division. If a man was not willing to accept the responsibilities of representation he had no business to allow his name to go forward. (Hear, hear.)

The President observed that this was the reason why he had moved the re-election of Mr. Standley: they all realised that Mr. Standley did his part in representing the Division on the Council of the "National." (Applause.)

Mr. Matthews also returned thanks for his election in suitable terms.

Any Other Business.

Scale of Fees.—Mr. Buchanan enquired if there was in existence an Eastern Counties list of professional fees. Other societies had such a list, and practitioners coming into the area of the Division, as he had done, would find it of great assistance to them.

Mr. Standley, Sen., replied that at Ipswich, some three or four years ago, they tried to draw up a scale of fees, but it was found to be impracticable to do so.

The Late Mrs. Wortley.—Mr. H. P. Standley rose to say that he thought the members would wish to pass a vote of condolence with Capt. Wortley in the death of his wife. Mrs. Wortley was a lady who took a great interest in the welfare of the profession, and only two years ago she was responsible for the holding of a function for the purpose of raising money on behalf of the Royal Veterinary College Re-building Fund.

The President, on behalf of the members, endorsed Mr. Standley's words, and the meeting passed the vote of condolence, standing in silence.

Farmers' Benevolent Fund.—Mr. Standley moved that a donation of £5 5s. 0d. be made to this Fund, saying that when he held the position of Hon. Secretary of the Division, the sum of £5 5s. 0d. was given every year. He felt that

in the present depressed state of agriculture such a donation would be a fitting and sympathetic gesture.

Mr. Boyle seconded the motion, observing that the veterinary profession and agriculture were very largely interdependent and that they should make the donation to show their appreciation of that fact.

The President warmly supported the motion, which was carried unanimously, and it was left to the Committee of the Benevolent Fund to allocate the votes which such a donation carried with it.

The 1931 Congress of the N.V.M.A.—Mr. Standley observed that, strictly speaking, the last congress of the N.V.M.A. should have been held at Norwich, but at the Newcastle Congress the meeting at which the decision was taken as to the venue of the next Congress was held on the Saturday, which prevented the southern members from arriving in time to prevent the northern element from securing the location of the 1929 Congress at Ayr. This year, of course, the Congress was to be purely a formal affair to be held in London just prior to the International Veterinary Congress, but he thought it would be a good thing if that Division sent an invitation to the Council of the "National," that they should hold their 1931 Congress at Norwich. He begged to propose accordingly.

The proposition was seconded by Mr. Dennett and carried unanimously.

Clinical Matters.

The President observed that, amongst the various matters upon which he had touched in his presidential address, he said that he was quite satisfied with the subcutaneous tuberculin test. He desired to relate a little incident that had altered his opinion somewhat. Some few months ago several cattle were sold to go to the Colonies, and, amongst other things, they were required to be subjected to the agglutination test for abortion and both the subcutaneous and the double intradermal tests for tuberculosis. These cattle lay in three or four different lots, and rather widely apart. He took the blood test one day, and also did the subcutaneous test on one lot of cattle previous to doing the double-intradermal test. One of these heifers gave a distinctly doubtful reaction to the subcutaneous test—a very slight curve—but when he applied the double intradermal test he got a most pronounced reaction. In the face of that, he felt that he must "eat his words" to some extent, and say that he was not more in favour of the subcutaneous test than of the double intradermal.

Another interesting thing had occurred that week, proceeded the President: a lady in Woodbridge had a large aviary of small birds, and he was asked to see them, as the previous Sunday night they were perfectly all right and next morning twelve of them were dead, and most of the others were ailing. The aviary was divided into two sections, and the affected birds were all housed in one section On Saturday a fir branch was put into one side of the aviary and these birds were found ill on the Monday. He sent the dead birds up to the Veterinary College and described the case to Dr. Hare, saying that it looked to him as though the chemist, the botanist and the pathologist would have to have a go at it. Dr. Hare reported that he could not find any bacterial infection and had passed the specimens on to Dr. Clough. He (the President) had heard from the latter, who said that he had tested for the mineral and alkaloid poisons, but could find nothing, and that he had come to the conclusion that the condition was caused by the birds pecking the pine bark, which contained a quantity of terpinaceous oils. A curious feature of the condition was that in no case were both partners in any pair dead.

Sulphur Poisoning in Bullocks.—Mr. W. H. Dennett said that he had a few remarks to make on a case which, although he feared it was only hearsay, struck him as rather interesting. It concerned some bullocks belonging to a friend of his, who farmed some fifty miles away from him, in a district which was looked after by an unqualified man, who had been attending these bullocks His friend 'phoned him up and placed the facts before him. Fifteen bullocks were running in a yard, and one died suddenly. The steward sent the carcass to the knacker, whose report was rather alarming, as he said the bullock died from anthrax. The following day there was another death, and in four days five of the bullocks were dead. The owner was away and all the carcasses were sent to the knacker, and the unqualified practitioner, who saw the bullocks, was emphatic in his opinion that the first case was not one of anthrax; there was no suggestion that the subsequent deaths were due to anthrax. The first carcass was finished with and nothing more could be learnt about that; some organs of the other animals were sent away for analysis; one lot to Richardson's, druggists, of Leicester, and another to the Royal Veterinary College. Richardson's reported that the bullocks had died of sulphur poisoning; the report from the College was absolutely negative. Richardson's said that the dose of sulphur for a bullock should not exceed 1½ over a period. When the steward was tackled he admitted that the bullocks had been receiving sulphur, but only for a few days, and none of them had had more than ¼ lb. Since the death of the fifth bullock there had been no more casualties.

He (Mr. Dennett) would like to know if any of the members had met with sulphur poisoning and, if so, how much sulphur one would have to give bullocks before symptoms of poisoning showed themselves.

Hysterectomy in the Bitch.—Mr. Buchanan said that he believed that text-books stipulated that the middle line should be chosen for the performance of the operation of hysterectomy in the bitch. He recently had occasion, with a colleague, to perform this operation on a Scotch terrier bitch, operating with complete success through the flank. They took away the womb and both ovaries, ligaturing the mass and removing it perfectly cleanly, and the bitch had made an uninterrupted and complete recovery. He should now always select the flank site for the operation in the bitch—as in the pig, only slightly lower down. Bitches were not quite such easy subjects for the operation as pigs, because of the arrangement of the womb.

Next Meeting.—It was decided to hold the next meeting of the Division (in July) at Cambridge. Professor Buxton intimated that, with a view to arranging the programme which would be most acceptable to the members, he proposed to circularise them all and to select items from the suggestions thus obtained.

Vote of Thanks to the President.—The meeting accorded a hearty vote of thanks to the retiring President for the

able manner in which he had occupied the chair during his tenure of office.

Major Heatley, acknowledging the compliment, said that he had enjoyed his year of office very much, and he thought that they had had quite a good session. (Hear, hear.) They had enjoyed some excellent meetings at which many matters of interest and importance had been considered. In common with them all, he was greatly looking forward to the coming session under the Presidency of Professor Buxton. (Applause.) He would now ask Professor Buxton to take his place in the chair, as he had to leave to catch an early train.

Mr. H. P. Standley said that although the business on the agenda was concluded, the afternoon was not spent, and he should like to take advantage of the presence of Professor Buxton to raise a few points in connection with the various tests for tuberculosis.

They had had to test herds of cows, and invariably with the subcutaneous method there were some indefinite reactors, but if they applied the double intradermal test to those animals they would find that often they passed quite well. The reverse was often the case, however; if they applied the double intradermal test they would frequently get a well-marked reaction. Some of the owners were not very willing to accept that interpretation, and these requested him to apply the subcutaneous test, when sometimes these animals passed that test without any difficulty. He should like to ask Professor Buxton what interpretation one was to put on such results in such cases. He (Mr. Standley) did not think that one got so many indefinite results from the subcutaneous test as from the double intradermal test.

The President (Professor J. B. Buxton), in reply to Mr. Standley's question, dealt with our present knowledge of tuberculin testing, and emphasised the necessity for tuberculin of guaranteed potency, especially in connection with the testing of graded herds, in order that the number of indefinite reactors might be reduced to a minimum.

Mr. Dennett observed that he had noticed several interesting things with regard to the subcutaneous test; one was that a large majority of so-called doubtful reactors, when tested again, almost invariably passed. Another interesting point was this: He had to deal with a large herd for grade A purposes; it consisted of 104 cows and four bulls. He had been testing that herd twice a year for five years now, and, as a rule (at any rate for three years past) the rejects had not numbered more than four or five, until the last test in October, 1929. He had never had cause to reject a bull until March, 1929, when two of the bulls had to be turned out. At the next test (six months later) the owner was somewhat horrified when twenty cows failed to pass the test; nineteen of these cows were in calf to one of the tuberculous bulls. That raised the interesting question of the ease or otherwise with which tuberculosis might be transmitted from the bull to the cow.

The proceedings now concluded, but before separating the members spent a sociable hour over the tea-table.

W. A. Wood, *Hon. Secretary.*

It has been estimated that about one-tenth of the graduate veterinarians in the United States are engaged in tuberculosis eradication work.

Central Division, N.V.M.A.

Professor Macqueen on the Publication of Particulars of Prescriptions.

Consideration of the above-mentioned subject occupied the larger part of a meeting of this Division which was held at 10 Red Lion Square, London, on Thursday, March 6th, 1930.

The President (Professor James Macqueen) occupied the chair and there were also present:—Mr. A. J. Beeson, Mr. W. Brown, Capt. L. S. Balls, Mr. H. E. Bywater, Major G. W. Dunkin, Mr. C. Formston, Dr. Tom Hare, Mr. H. C. P. King, Mr. Herbert King, Capt. W. J. Leyshon, Mr. G. H. Livesey, Professor J. McCunn, Capt. G. Dunlop Martin, Mr. A. B. Orr, Mr. W. Perryman, Mr. J. H. Poles, Vetr.-Maj. G. Rees-Mogg, Mr. J. Rowe, Miss K. W. Shedlock, Mr. A. W. Stableforth, Capt. R. J. Stow, Mr. E. L. Stroud, Capt. W. K. Townson, Capt. S. Villar, Mr. F. W. Willett, Mr. R. A. Willett, Mr. J. D. Williams, Professor J. G. Wright, and Capt. J. F. Macdonald, Hon. Secretary, together with Messrs. G. G. Poles, A. Sillars, and A. S. Watson as visitors.

Apologies for their inability to attend the meeting were received from Messrs. H. Bell, G. P. Male, H. L. Roberts, and E. Alfred West.

Removal of Thorn from Terrier's Eye.—Capt. Dunlop Martin exhibited a thorn, nearly an inch in length, which, he said, he had removed from the eye of a terrier nearly a year ago. The terrier was brought to him with the butt of the thorn protruding scarcely an eighth of an inch from the middle of the cornea. He expected to have to remove the eye, and he told the people who brought the dog to him to be prepared for that. He put the terrier under an anæsthetic at once, and managed to get hold of the thorn with forceps and to remove it, though it took quite a pull to get it out. Blood streamed from the wound, but he thought he would give the eye a chance, in the hope that the blood would wash out any infection. The lucky thing happened. He dressed the eye carefully and the organ healed perfectly.

Anti-rabies Inoculation Certificate.—Capt. R. J. Stow remarked that an incident that recently occurred might be of interest to the Fellows. It had to do with a dog which belonged to a client of his who had gone to live in Portugal, and who wrote to him saying that she wanted the dog to go out to Portugal, but that before it could be admitted to that country a certificate of inoculation against rabies was required. The lady added that she was sending him a dose of anti-rabies vaccine from Portugal. It arrived, but the instructions were in Portuguese and he hesitated to put it into a dog in England in case the animal should develop rabies. Accordingly, he rang up the Chief Veterinary Officer of the Ministry of Agriculture and asked his opinion. The latter's first observation was a decided negative, but when he (Capt. Stow) told him that written in the label were the words "Virus Morbo," which he interpreted as "Dead Vaccine," the Chief Veterinary Officer said that he could use it, and keep the dog isolated for the five days before it sailed for Portugal.

Nominations.—Nominations as Fellows were made

of Messrs. R. E. C. Bullen, G. N. Gould, junr., S. Gourlay, Major F. S. Probyn and Mr. A. Sillars.

Elections.—The following gentlemen were unanimously elected as Fellows of the Division:—Major J. J. Soutar, O.B.E., Lt.-Col. J. B. B. Tapley, D.S.O., and Lt.-Col. W. H. Walker, D.S.O., O.B.E., R.A.V.C.

Remarks by the President.

The agenda-paper contained a series of six points to be introduced by the President for consideration and discussion. In the event it proved that time would not allow of consideration of more than the first of these points, which was as follows: "Is it desirable to publish particulars of prescriptions mentioned by essayists and speakers in discussion?"

The President, in presenting this subject to the Fellows, said that he had the honour of appearing before them for the purpose of introducing that subject for discussion. Before proceeding, he thought he ought to apologise for the delay in submitting those questions to them. They were drafted in June of last year and were intended to fill any gap that might arise during a meeting. They had appeared on the agenda more than once, but they had been shelved on each occasion, owing to the loquacity of members in discussing other subjects of greater value and urgency.

He was doubtful if they would have sufficient time that night to discuss all the questions and he should begin with the first, and when that had been disposed of a selection might be made from the remainder.

In bringing those questions before them, his aim was to reach, if possible, agreement on one side or the other of the question at issue. He might be too hopeful, or even idealistic, in seeking to obtain agreement, but no harm could come from free and unfettered discussion of one or all of those questions.

He should like to see unanimity within the profession on those and similar questions, about which there was considerable difference of opinion.

Numerically, our profession was not a large one and it should be regarded in practice as a brotherhood, so that metaphorically, should one member take snuff all the other members would be ready to sneeze with him. (Laughter.)

To facilitate freedom of speech and, at the same time, lessen the work of their reporter, it might be considered advisable to go into committee, after the example of their own parliament—the R.C.V.S.—which appeared to discuss questions of supreme importance in committee, forgetting that the electors might like to know what had been said by their representatives on the Council. The question: "Is it desirable to publish particulars of prescriptions mentioned by essayists and speakers in discussions?" was intended to include proprietary preparations of drugs and organic extracts as well as combinations of the medicines recognised by the *British Pharmacopœia*.

Personally, he held no definite or positive views regarding the advantages or disadvantages of publication, but there were a few points in relation to this question that should be noticed:—

What were the benefits of publication to:—

(1) The profession;

(2) The sponsor or introducer of the prescription;

(3) The patients, real or potential?

Some Objections to Publication.—He would enumerate these as follows:—

1.—The information might be reproduced in agricultural, canine, and chemists' journals and used by laymen and unqualified persons to the detriment of veterinary surgeons.

2.—Its effect might amount to advertising a proprietary remedy or to giving an oblique testimonial to a quack preparation, of which the contents were only known to the maker. In the *Veterinary Record*, March 1st, p. 189, Mr. Barker was said to have refused to publish details of the use of contramine and of S.U.P. 468, "as he had reason to know that other people were seeking to take advantage of the work they were doing."

3.—Was it probable or possible that a published prescription might mislead the practitioner who gave it a trial?

4.—Did publication of a prescription sometmes enable the wholesale druggist to prepare a similar remedy for sale under a fancy name?

5.—Was their knowledge of the action of drugs on the domestic animals sufficiently accurate and comprehensive to justify indiscriminate publication of prescriptions?

Dscussion took place in Committee, and, at its close, the meeting decided that particulars of prescriptions, excepting proprietary remedies, should be published in the veterinary press.

The following members took part in this discussion: Captain Dunlop Martin, Professor Wright, Mr. R. A. Willett, Major Dunkin, Professor Hare, Mr. Stableforth, Mr. Livesey, Mr. Perryman, Mr. Formston, Professor McCunn, Mr. Orr, Captain Stow, Mr. Sydney Villar, Mr. J. Rowe and the President.

Discussion of the five remaining questions was postponed to a future meeting.

The meeting concluded with the passing of a hearty vote of thanks to the President for bringing forward, and introducing the discussion upon, the point which had occupied the attention of the society thoughout the evening.

J. F. Macdonald, *Hon. Secretary.*

Uganda Veterinary Association.

A meeting of the above Association was held in Mr. Richardson's house at Kampala on Saturday, November 30th, 1929.

The President read the notice convening the meeting and asked that a Secretary be appointed for the meeting. Captain Aitken consented to act as Secretary.

The President (Mr. R. L. L. Hart) then explained that the meeting had been called to decide the future of the Association. Owing to the exigencies of the Service it had not been possible to hold a previous meeting and it was necessary to decide whether an effort should be made to continue the Association or whether it would not be better to dissolve.

After considerable discussion, it was proposed by Mr. Hart and seconded by Mr. Richardson that the Association be continued and that its activities be confined to its original objects, *i.e.*, the advancement of professional knowledge and social intercourse. The proposition was carried *nem. con.*

Election of Office Bearers for the Year 1930.

President.—Mr. Hart proposed, and Major Foster seconded, that Mr. Richardson be elected. Mr. Richardson

explained that it would not be possible for him to accept this office. He asked permission to withdraw and proposed Major Foster for the office of President. Captain Aitken seconded this latter proposal and Major Foster was unanimously elected as President.

Vice-President.—Capt. Mackintosh proposed and Mr. Fisher seconded that Mr. Richardson be elected as Vice-President. This was carried unanimously.

Hon. Secretary and Hon. Treasurer.—Capt. Mackintosh proposed, and Capt. Aitken seconded, that Mr. Fisher be elected to this office. The election was unanimously made.

New Members.—Messrs. Murray and Stewart were elected as members of the Association.

The Annual Subscription.—On the proposition of Mr. Richardson, seconded by Mr. Fisher, it was agreed that the Annual Subscription be 5s. and that it be retrospective for 1928-29.

N.V.M.A. Annual Affiliation Fee.—After discussion it was agreed that the Association should continue to pay this fee and the Hon. Treasurer was instructed to forward the amounts outstanding for 1928-29.

Next Meeting.—Mr. Richardson proposed and Captain Aitken seconded and it was resolved that the Hon. Secretary be instructed to call a meeting during the next six months and that a member be asked to read a paper on some professional subject of local interest, the time and place of the meeting to be fixed later.

There being no other business, Mr. Richardson proposed a hearty vote of thanks to the retiring President.

Capt. Mackintosh proposed a vote of thanks to Capt. Aitken who acted as Secretary to the Meeting.

R. C. U. Fisher, *Hon. Secretary.*

From The Veterinarian,

January, 1830.

The Symptoms and Cure of Navicular Disease in the Feet of Horses.

By Mr. James Turner, Veterinary Surgeon, Regent Street, London.

(Read at the Veterinary Medical Society, December 4th, 1829.)

Gentlemen,—In the month of December last I had the honour of reading to this Society a paper explanatory of my views regarding the nature of the navicular disease, or chronic lameness in the fore feet of horses, together with the causes of that destructive malady.

The method of treatment and cure is the object of the present paper for this evening's discussion.

This very prevalent complaint, commonly called groggy lameness, has been shown to exist generally in the navicular joint; and I think I may safely assert that the term navicular lameness has now become as current among veterinary practitioners as coffin lameness used to be among the ancients.

Although dissection generally affords satisfactory evidence of the seat of disease, yet it does not as uniformly serve us in tracing its causes, the investigation of which is generally involved in more obscurity, and consequently is too often speculative. But with respect to the probable causes of the disease in question, I think there is as much light elicited by the dissection of the morbid specimen as we could desire. Commencing with the ground surface of the horny frog, and unfolding, layer by layer, all parts until we arrive at the carious surface of the navicular bone, there will be presented, at one view, that which not only fully explains all the phenomena of the disease, but suggests to us the method of cure, and even points to a rational mode of shoeing.

I beg to observe that in my former paper I took upon myself a sort of classification of contraction, or rather its division into two kinds; the one under the designation of *simple* or *general* contraction, such as the narrow-heeled foot with lengthened toe, which is so very prevalent, and obvious to the common observer; and which is frequently seen unaccompanied with lameness, and even sometimes remains harmless through a long life of hard work. The other I have called the *occult* or *partial* contraction, which is one of the most insidious diseases to which the horse is subject; and so specious is the exterior of such a foot, that none but a most experienced eye would discover the existence of any disease, unless attracted to it by an accompanying lameness—circularity, solidity, compactness of fibre, and an unusual appearance of strength, being its characteristics; the heels are high, the sole strong, and the crust thick, particularly at the toe, but it sometimes loses its due proportion of obliquity, and becomes rather more upright than natural. There is, however, a more certain indication which usually presents itself, *viz.*, a falling in of the inside quarter, or slight indentation about the middle of the crust towards the heel; this sometimes assumes the appearance of a stricture, in a slight degree, all round the crust, and occasionally two or three of these strictures or rings are apparent.

Thus much may be observed without the removal of the shoe; but the protrusion of the frog within the foot (adverted to in my former paper), together with the morbid concavity of sole, may not be discoverable till the drawing-knife has been extensively employed, not only on the sole, but in excavating those channels or commissures on each side of the frog, between it and the bars. An inordinate growth of sole and other parts of the foot, by presenting prominent surfaces, too often conceals from our view the encroachments and consequent diminution of the horny cavity. This may be compared to the deceptive wine-bottle commonly used; while standing on its basis, it appears plausible enough as to its capacity; but when inverted, a most lamentable protrusion is discoverable in its breech, which proves to be a preparation of flint instead of the grape. The outer surface of the sole of such a foot sometimes resists the drawing-knife like a stone, from its excessive hardness.

(To be continued.)

The International Horse Show.

The 19th annual International Horse Show will be held at Olympia from June 19th to June 28th. It is expected that the competitions for the trophies presented by the King and the Prince of Wales will be of unusual interest. Already entries have been received from Germany, France, Belgium, the Irish Free State, and England, and it is hoped that Italy and Canada will be represented.

The leading feature of the show will be daily displays of horsemanship by a detachment of the Royal Canadian Mounted Police, of which the Prince of Wales is honorary commandant. The detachment will consist of one officer and 24 men. This will be the first time that displays will have been given by this noted force outside Canada. It may be recalled that a detachment of similar strength took part in King George's Coronation procession.

Deficiency of vitamin A in feed is evidenced by failure to grow, xerophthalmia, respiratory and digestive disorders. White corn, dried beet pulp and powdered skim milk that is oxidised by exposure to light and air are practically free from vitamin A. Cod liver oil should be provided for animals fed a ration deficient in vitamin A.—*Dairy Science*, Vol. 9, No. 2.

Reviews.

[**Diseases of the Blood.** By A. Piney, M.D., M.R.C.P. Twenty illustrations, six in colour. London: J. and A. Churchill. 1928. 12s. 6d.]

The opening introduction is one of the most instructive chapters of any hæmatological text book; it gives a clear, concise account of the many cells of the blood, their character and ancestral development, yet it does not overstress the many divergent views on blood genealogy. On these first 18 pages alone is sufficient information to warrant the purchase of the book.

The first nine chapters are devoted to the study of the variations of the red and white cells in health and disease. They have added value in that the author has incorporated much continual work into them, making the whole work absolutely modern in every sense.

Chapter X is devoted to conditions of the spleen, which, whilst of academic interest, will naturally appear rather complicated to the ordinary practising veterinarian.

The last chapter gives a brief résumé of the symptomatic blood changes seen in disease, and is arranged in alphabetical order.

The first appendix concerns technique. It is a most valuable addition to the text, and includes many new suggestions, chiefly concerning the oxydase reaction of the marrow cells, the preparation of the bone marrow, and the differential count of the leucocytes.

Appendix II concerns blood groups and transfusion; and the last Appendix concerns X-rays and radio-active substances. Dr. Piney is a recognised authority on the action of X-rays on blood and blood-forming organs, having worked on these subjects for some years past at the Cancer Hospital (Free), London.

Finally, there is an excellent Glossary, which is an essential part of any modern text book.

The black-and-white illustrations are well drawn, but never convey quite the same impression as the coloured plates, which, in this instance, give true pictures of most of the important blood cells.

The book is bound in the usual good style of Messrs. J. and A. Churchill, and should form a worthy addition to any collection of blood books.

W. P. B.

[**Recent Advances in Hæmatology.** By A. Piney, M.D., M.R.C.P. 2nd Edition. Four coloured plates and 18 text figures. pp. 318. London: J. and A. Churchill. 1928. 12s. 6d.]

The "Recent Advances" series of text books has proved highly interesting, and this volume has certainly maintained that standard.

It is a collection of advanced knowledge on special branches of hæmatology, dealing principally with modern conceptions of leukæmia, pernicious anæmia, and splenomegaly.

Hæmatology refers throughout the book to the cytology of the blood and not to its biochemistry or physics.

The first chapter, on the development of the blood cells in relation to the reticulo-endothelial system, is most interesting, and gives the reader an idea of how complicated are the present views concerning the blood cell progenitors. Further, it throws some light into the possible pathology of "azoturia"—equine hæmaglobinuria. Normally, the cells of the widely-scattered reticulo-endothelial system (cells of the splenic pulp, of the medullary follicles and "cords" of lymph glands and other lymphatic structures, Kupfer cells, etc.) ingest ferruginous pigment, but after previous injection of a suitable dye into the blood stream these cells can no longer be phagocytic for iron pigments and hæmoglobinæmia and hæmoglobinuria result.

An appendix on hæmatological technique is added and exceeds in value the appendix in Piney's "Diseases of the Blood." A full account of the enumeration of the blood cells, using Piney's Automatic Blood Diluting Pipettes, and the method of staining (Piney's modification of Pappenheim's panoptic method) is included. Cover slip preparations, stained according to this method, give excellent results, particularly the neutrophilic granulocytes of man. Further valuable paragraphs are added concerning vital staining for the reticulocytes, the resistance of red corpuscles, the enumeration of platelets, suspension stability, and the histological examination of the hæmatopoietic tissues.

A second appendix gives a highly interesting but brief account of the text books and monographs utilised in the preparation of the book. The authors' names are classified alphabetically, and terse descriptions of their works appended. There are about 120 such references, which will be invaluable to those who study hæmatology in any sincerity.

A glossary and index are added, but the latter is unfortunately hidden in a rather awkward position and may cause confusion.

The coloured plates of the individual blood cells are excellently depicted; unfortunately the scale for the size of the cells is only given on Plate IV; it refers, in addition, to the three preceding plates.

The book is very well written and adequately illustrated, but it is essentially for advanced students.

W. P. B.

"Special Grade" Milk.

An unusual defence was put forward in a case at Leicester Police Court recently, when Herbert Ladkin, a farmer, of Ashby Folville, pleaded "Guilty" to selling milk containing added water. Evidence was given that in one case there was 49 per cent. added water. Mr. Loseby, who defended, said that Ladkin had made a speciality of producing a special grade of milk. The cowman asked him to put a number of cows in his charge so that they could be intensively fed. Ladkin agreed, and the milk supply from the cows steadily increased. Ladkin spoke one day of having a test made, and the cowman absented himself, and when Ladkin milked the cows himself he found that the yield was substantially below what had been reported to him. It appeared to have been purely vanity on the part of the cowman. A fine of £30 was imposed.

There is no doubt that big changes are occurring throughout the world in regard to cattle stocks, and the lesson for the British farmer is that he should now take steps to increase the supply of cattle of the right type.—*Ministry of Agriculture.*

XUM

Preparation of Bones of Animals for Museums.

The skeleton is made reasonably free from the soft parts by dissection. The skull may be sawed across horizontally and the top removed to facilitate removal of the brain. If it is desired to preserve the skull intact, it may be disarticulated and the brain removed through the great foramen at the base with little additional work. The large bones are disarticulated and the small bones of each carpus and tarsus are placed in small separate sacks to keep them together.

The bones are now boiled in a solution containing for each litre of water 30 gm. of potassium carbonate and 15 gm. of sodium sulphide. The boiling will require a few hours, longer if the bones are large than if they are small. They should be watched, as prolonged boiling will result in their disintegration. The process will be expedited if they are brushed with a brass brush from time to time.

When the bones are free from all soft parts they should be rinsed, allowed to lie a few minutes in "ammoniated water" and then allowed to soak in warm, soft water several hours to remove the sodium sulphide. They should then be dried and bleached in the sun. If much grease remains in the bones, it can be removed by soaking them in calcium tetrachloride and rinsing in ammoniated water. This can be expedited by warming the water. If the bones are not sufficiently white, they can be bleached to an ivory whiteness by placing them in equal parts of water and solution of hydrogen peroxide. This may require a few hours or a few days. At the end of the process exposure to the sun will make the surface uniformly white. Better results are obtained throughout if during the heating processes the temperature is kept just below the boiling point.

The process outlined is recommended by Mr. John Rowley of the American Museum of Natural History and will be found to give excellent results.—*Jour. A.M.A.*, v. 92, No. 22.

World Poultry Congress.

The programme of papers to be read by international authorities at the World Poultry Congress in July is now being prepared, and it is possible to forecast the features that will be dealt with in the British section. Papers will come under five heads—(*a*) breeding and incubation; (*b*) nutrition and rearing; (*c*) diseases and their control; (*d*) economics and marketing; (*e*) education and general—while in addition there will be several papers on rabbits.

Professor R. C. Bunnett, F.R.S., will contribute an important paper dealing with experiments on the inheritance of fecundity in fowls, and Mr. Tom Barron, the pioneer breeder of pedigree laying stock, will explain the Lancashire Utility Poultry Society's breeding scheme, which for the first time introduces the principles of the stud book in poultry breeding. Dr. G. Scott Robertson, of the Ministry of Agriculture of Northern Ireland, will speak on nutrition of the chick and the effect on growth; Mr. Tom Newman will contribute a paper on food in relation to the hen; Professor Parkhurst, of the National Institute of Poultry Husbandry, will discuss the use of cod-liver oil in the ration of the laying hen; and Dr. J. B. Orr, Principal of the Rowett Institute, will tell of the mineral and protein requirements of poultry Dr. Ethel Cruikshank and Dr. F. C. Kelly will speak of the uses of iodine in the poultry yard, and papers on diseases stand in the names of Major Dalling and Captain Doyle. On the educational side the contributors will include Dr. Charles Crowther, of the Harper Adams Agricultural College, and Mr. P. A. Francis, Director of the Congress.

Since the resumption of diplomatic relations, the Soviet Government has accepted an invitation to be represented at the Congress, and arrangements are being made whereby a national exhibit will be staged showing phases of poultry practice in Russia.—*The Times.*

Notes and News.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

April 7th.—Meeting of the Editorial Committee, N.V.M.A., 4.30 p.m., at 2 Verulam Buildings, Gray's Inn, W.C.1.

April 10th.—Meeting of the Central Division, N.V.M.A., at The Royal Veterinary College, Camden Town.

April 11th.—Meeting of the Mid-West and South Wales Division, N.V.M.A., at Bath.

April 12th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds.

April 17th.—Annual Dinner of the North Wales Division, N.V.M.A., at Carnarvon.

June 5th.—R.C.V.S. Annual General Meeting, Dublin.

June 13th.—D.V.S.M. Written Examinations.

June 16th.—D.V.S.M. Oral Examination commences.

July 2nd.—R.C.V.S. Quarterly Meetings.

July 3rd.—R.C.V.S. Quarterly Meetings.

July 4th.—R.C.V.S. Quarterly Meetings.

July 7th.—R.C.V.S. Membership Examination commences.

AUGUST 4th to 9th.—11th INTERNATIONAL VETERINARY CONGRESS, CENTRAL HALL, WESTMINSTER.

Eleventh International Veterinary Congress, London, August 4th to 9th, 1930.

The International Veterinary Congress to be held at the Central Hall, Westminster, from the 4th to the 9th August next, is receiving support from foreign governments in all parts of the world. Official Delegates have already been appointed by the following countries:—

Canada; New Zealand; South Australia; Union of South Africa; Irish Free State; Northern Ireland; Gold Coast; Kenya; Uganda; Tanganyika Territory; Northern Rhodesia; South African High Commission Territories; Nigeria; Malay States; Straits Settlements; Iraq.

Albania; Austria; Belgium; China; Denmark; Ecuador; Germany; Greece; Guatemala; Holland; Nicaragua; Roumania; Sweden; Turkey; Yugoslavia.

The Minister of Agriculture has promised to attend the first meeting and to declare the Congress open.

In addition to the scientific work of the Congress, there will be arranged a number of excursions to Research Institutes, Veterinary Colleges, Racing and Breeding Establishments. These will take place during the week following the Congress.

The Corporation of the City of London has promised to give a Reception at Guildhall to all Delegates, and the Government Hospitality Fund has undertaken to give a Banquet to official Delegates. In addition there will be a Reception at May Fair Hotel, a Conversazione at the Natural History Museum, and a general Congress Banquet, to all of which lady members will be welcome.

The Membership Subscription is:—

Ordinary Members, 30s., which includes a complete copy of the Report of the Congress containing the papers read and the discussions thereon.

Student Members ... ... 10s. 0d.

Lady Members ... ... 5s. 0d.

Applications may be sent in at once, and should be made on forms to be obtained from the General Secretary. It is hoped that members of the R.C.V.S. from both Great Britain and Ireland will attend the Congress in large numbers.

Personal.

Professor Wooldridge.—Our readers will be glad to learn that Professor G. H. Wooldridge is making satisfactory progress. He and Mrs. Wooldridge desire to thank their many friends in the profession for their kind enquiries and good wishes.

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Engagement.—Major F. Weir and Miss M. Ambrose. The engagement is announced, and the marriage will shortly take place, in London, of Major Frederick J. Weir, R.A.V.C., Ferozepore, Punjab (India), son of Mr. and Mrs. Robert Weir, Northumberland Road, Dublin, to Margaret M. F. Ambrose, elder daughter of Mr. and Mrs. Edward Ambrose, late of "El Rosario," Claygate, Surrey.

In Parliament.

Royal Veterinary College.

Mr. Buxton (Minister of Agriculture), in reply to a question on 20th inst., stated that the Treasury has approved a recommendation by the Development Commissioners that, subject to certain conditions, a grant not exceeding £100,000 on a £1 for £1 basis should be made to the Governors of the Royal Veterinary College for the reconstruction of the college on the present site.

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Disease Attributed to Milk.—Replying to Mr. Wilfred Whiteley, on March 20th, Mr. Greenwood said complete particulars of the number of epidemics of infectious disease attributed to milk were not available. Such information as was available was in the reports of the chief medical officer. In the returns of the Registrar-General no separate figures were given for disease attributed to milk. Replying to Dr. Vernon Davies, Mr. Greenwood stated that imported milk was subject to examination for tubercle under the Imported Milk Regulations, but it was not the practice to examine imported milk products for this purpose. He could not affirm that all these imports were from tuberculin-tested animals.

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Minister of Health and Cattle Shows.—Answering Mr. Ramsbotham, Mr. Greenwood said he had been informed that some of the bodies responsible for the organisation of agricultural shows were now prepared to arrange for the segregation of animals belonging to licensed tuberculin-tested herds, and he had promised to see their representatives with a view to considering the withdrawal of the prohibition in the case of shows where effective provision was made for this purpose.

In this connection, the *Morning Post* of 27th March stated:—

"The deputation which has just waited on the Minister of Health in reference to the Order of that Department forbidding the sending of cows producing Grade A (T.T.) milk for agricultural shows, is not disappointed with its reception. The deputation was joined by several members who were not connected with the Agricultural Committee—notably Mr. Neville Chamberlain and Mr. Runciman.

"For weeks the subject has been eagerly discussed by dairy farmers and stock breeders. The latter, especially, fear they will be gravely injured by the prohibition, because an important market will be taken away from them. Both sections admit that tubercle-tested cattle should not be exhibited with others not so tested at indoor shows; and that at the others there should be rigid separation of the two classes.

"It is now known that the Royal Agricultural Society was not consulted before the Order was issued, neither was the consent of the Dairy Farmers' Association sought. This is the time of year when arrangements for agricultural shows all over the country are being made, and the officials are being gravely hampered by the existence of the Order.

"The Ministry will at once get into communication with the Royal Agricultural Society, and there is some reason to think that a modification of the Order may result."

Exportation of Horses.

In view of the disturbing and misleading allegations made in certain recent newspaper articles concerning the export of horses for immediate slaughter, the Minister of Agriculture and Fisheries desires to give publicity to the facts, which are as follows:—

The law of Great Britain prohibits the shipment from this country of any horse unless it has been examined by a Veterinary Inspector of the Ministry immediately before shipment and passed as fit to travel and also to work without suffering. This prohibition is very rigidly enforced, and the Ministry has not reduced in the slightest degree the high standard of fitness which has now for some years been adopted in respect of every horse passed for export. It may be accepted that no horse which could be described as decrepit or worn out is allowed to be exported.

The recent newspaper articles could only have led the public to believe that 200 or more horses are sent to the Continent every week from these shores to be slaughtered at certain abattoirs in France under ghastly and cruel conditions, but nothing could be farther from the truth. Apart from the question whether the conditions at the Paris abattoirs referred to in those articles have been correctly reported, no horses have been sent there for slaughter from this country since 1925, so that those conditions have no relevance whatever to horses sent from Great Britain for slaughter.

During 1929 the total number of horses passed for shipment to the Continent was 9,912. According to the information furnished to the Ministry's Inspectors at the ports at the time of shipment, 4,371 of these were intended for slaughter on arrival abroad, and all but 29 of the latter went to Holland, where the use of the humane killer is made compulsory by law and where the public abattoirs are among the best in the world. The remaining 29 were all, according to the information received by the Ministry, slaughtered with the humane killer at the Boulogne abattoir.

It will be recalled that the export trade in horses was thoroughly investigated in 1925 by a Departmental Committee, who reported that they were satisfied that the provisions of the Exportation of Horses Acts were efficiently carried out and that the closing of the Continental market to horses from this country passed as fit to work could not be justified on any grounds.

At Edinburgh Corporation Farm at Colinton Mains, a herd of over 90 tubercle-free cows is maintained for the production of certified milk for the city hospitals. Mr. Arthur Gofton, F.R.C.V.S., chief veterinary inspector for the city, addressed a gathering at the Health and Hygiene Exhibition, Edinburgh, on the methods adopted.

R.C.V.S. Obituary.

Galloway, Charles, 9 Holmesdale Road, Richmond, Surrey. Graduated N. Edinburgh, December 17th, 1885. Died March 25th, 1930, age 72 years.

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Death of Lieut.-Col. R. Rowe.

We regret to have to announce the death of Lieut.-Col. R. Rowe, retired pay, late Army Veterinary Department, which occurred at Balham, London, on March 21st, 1930, at the age of 86 years.

The deceased officer graduated in London on April 21st, 1869; was gazetted Veterinary Surgeon in the Army Veterinary Department for duty with Royal Artillery on July 14th, 1869; promoted Veterinary Surgeon 1st Class on July 14th, 1881; Major, July 14th, 1891; placed on retired pay on reaching the age of 55 on February 7th, 1900; granted rank of Lieut.-Col. whilst on retired pay, October 18th, 1902. He rejoined for duty during the Great War and served from August 8th, 1914, to December 15th, 1915, for which he received the thanks of the Army Council.

We tender our deepest sympathy to his relatives in their sad loss.

National Horse Association.

Lieutenant-Colonel Sir Archibald Weigall, K.C.M.G., will be the new president of the National Horse Association of Great Britain, while Major-General Geoffrey H. A. White, C.B., C.M.G., D.S.O., will be the vice-president (*i.e.*, president in 1931). In addition to receiving the support of an increasing private membership, this association has now the co-operation of 13 horse-breeding societies, 11 veterinary societies, 40 agricultural societies, and of 24 other societies interested in the horse.

Livestock Improvement Scheme.

"The livestock improvement scheme instituted and organised by the Ministry of Agriculture has already proved its merits in several districts. The results in such areas as Lancashire, Yorkshire, Hereford and Worcestershire, and Buckinghamshire and Hertfordshire have long been of marked advantage. The progress of the scheme in Derbyshire also would appear to be giving satisfaction. Competitions open to the progeny of premium bulls were arranged this year with a view to encouraging the movement, and the judges report favourably on the classes of animals entered for their inspection. If the improvement in Derbyshire is as pronounced as at other competitions of the kind, the benefit of the system is adequate justification for the giving of greater care to the selection of bulls. The only breed mentioned in the report on the Derbyshire contests is the Lincoln Red Shorthorn, but presumably the majority of the herds are of other varieties. It would seem also that dairying types predominate. In a case of the kind it is important to know the breed, and the strains of the breed, favoured, as ideas and requirements vary in different districts. The 'scrub' bull has no supporters, or defenders, in any quarter, and it is gratifying to learn that selected bulls for any definite purpose are giving a good account of themselves."—*The Times.*

Royal Army Veterinary Corps Golfing Society.

1930 Meeting.

The Annual Meeting of the Society will be held, by the kind permission of the North Hants Golf Club, at Fleet, on May 14th and 15th, 1930.

Programme of Events.

First Day: Morning.

(*a*) Eighteen holes Singles (medal play), Scratch for R.A.V.C. Challenge Cup.

(*b*) Eighteen holes Singles (medal play), under Handicap, for R.A.V.C. Founder's Cup.

These two events will be carried out concurrently.

Afternoon.

Eighteen holes Foursome (medal play), under Handicap for a prize value two guineas.

Second Day: Morning.

Eighteen holes Singles play, under Handicap, *v.* Bogey, for a Cup presented by the Captain of the Society (Major G. T. T. Jackson). Entrance fee, 2s. 6d.

Afternoon.

Eighteen holes Foursome play, under Handicap, *v.* Bogey for a prize value two guineas. Entrance fee, 2s. 6d.

There will be optional sweepstakes of 2s. 6d. on each handicap event.

Notes.

1. The R.A.V.C. Challenge and Founder's Cup.—No competitor may take more than one of these prizes.

2. Competitors may choose their own partners, and should inform the Hon. Secretary of the names of their partners when entering. In the event of their inability to do so, the Hon. Secretary will arrange. Competitors must declare their lowest club handicap before commencement of play.

3. Competitors should be ready to start at 10 a.m. Order of starting will be arranged by the Hon. Secretary.

4. Members are requested to notify the Hon. Secretary of the Society: c/o Station Veterinary Hospital, Aldershot, Hants (Telephone, Military 102), as early as possible:—

(*a*) Whether it is their intention to be present at the Meeting—to enable the necessary arrangements re meals, etc., to be made.

(*b*) Whether they want caddies.

5. Accommodation: Station Hotel, Fleet; Golf Club House (very limited). Those desiring accommodation at the Club House should inform the Hon. Secretary as soon as possible.

The above competitions are open to officers of the Territorial Forces (serving and retired) and ex-temporary officers of the Corps.

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Yeomanry Veterinary Officers: Second Anglo-Boer War (1899-1902).

To the Editor of the Veterinary Record.

Sir,—Regarding Yeomanry Veterinary Officers who served in South Africa 1899-1902, Sir Frederick Smith, on p. 259 of "A History of the R.A.V.C.," states, "Names unknown, being regimental officers; they are believed to have been about 30 in number." Now, as two years have elapsed since the above history was published, it would be interesting to know whether an endeavour has been made to trace the names. If not, may I suggest that enquiries be made through your columns. It is a duty we owe not only to those who served but also to ourselves.

Sir Frederick made a similar comment concerning Colonial Veterinary Officers, "believed to have been about 60 in number." Here, however, definite information is available, thanks to the courtesy of the Deputy Minister, Department of National Defence, Ottawa, and the Minister of Defence, Melbourne, both of whom furnished me not only with the names but also with the records of V.Os. who served in this country.

The names of four New Zealand V.Os. are known, and with regard to South Africa, apart from the eight mentioned by Smith (Natal Volunteer Veterinary Corps), I have traced an additional eight. This information I hope to publish on completing my enquiries.

Yours faithfully,
H. H. Curson.

Faculty of Veterinary Science,
(Transvaal University College),
P.O. Box 593,
Pretoria.
March 8th, 1930.